



MATHEMATICS

CLASS VIII

COMPARING QUANTITIES



Blue Bells Model School
Sector-4, Gurugram



0852CH08

Acknowledgement

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Disclaimer

This is a work of fiction by Blue Bells Model School, Sector 4, Gurugram. The novel is designed to motivate young learners, ignite interest and provide a better understanding of the concept. It is meant to supplement, not replace the information in the textbook. The characters in this graphic novel are fictitious and any resemblance to names, characters or incidents is coincidental.

Preface

This Graphic Novel on Comparing Quantities will take you deep into the world of Profit, Loss, Discount and Compound Interest.

The idea behind creating this novel is to energise young minds and to invigorate their knowledge about Commercial Mathematics. This book will give you a glimpse of the Fair and at the same time make you aware of Profit, Loss, Discount and GST. Understanding the power of Simple Interest, Compound Interest and its application is the essence of this novel.

Learning Objectives

Students will be able to

- convert ratio to percentage in order to solve the given questions
- apply the formula for discount and discount percentage in order to solve the given problem on discount
- calculate the discount in given situations in order to comment whether the seller has made a profit/loss in the given transaction
- define and compare simple interest and compound interest in order to comment on the situations where either of the two are applied
- calculate the simple interest in order to find the total amount to be paid by the debtor
- use formula of simple interest in order to deduce the formula to calculate the compound interest
- calculate the compound interest in order to find the total amount to be paid by the debtor
- define the terms 'compounded annually', 'compounded half yearly' and 'compounded quarterly' and give examples in order to differentiate between the three
- use formula of compound interest in order to solve problems related to increase (or decrease) in population
- use formula of compound interest in order to solve problems related to increase (or decrease) in the price of an item in intermediate years

Learning Outcomes

- apply the concepts of profit and loss, discount, tax, simple and compound interest in day-to-day transactions and cash management.
- develop financial skills effectively.

Characters



Ansh

An enthusiastic, inquisitive and naughty class 8 school boy
(13 Years old)

Anvi

A bright, lively and cheerful class 8 schoolgirl (13 Years old)



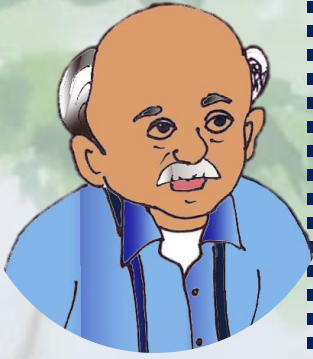
Father

A Software Engineer
(42 Years old)

Mother

A dedicated home maker,
expert in cooking and good at
Mathematical concepts
(38 years old)





Dada Ji

Source of inspiration and strength for children.

(68 Years old)

Shopkeeper 1

(50 Years old)



Shopkeeper 2

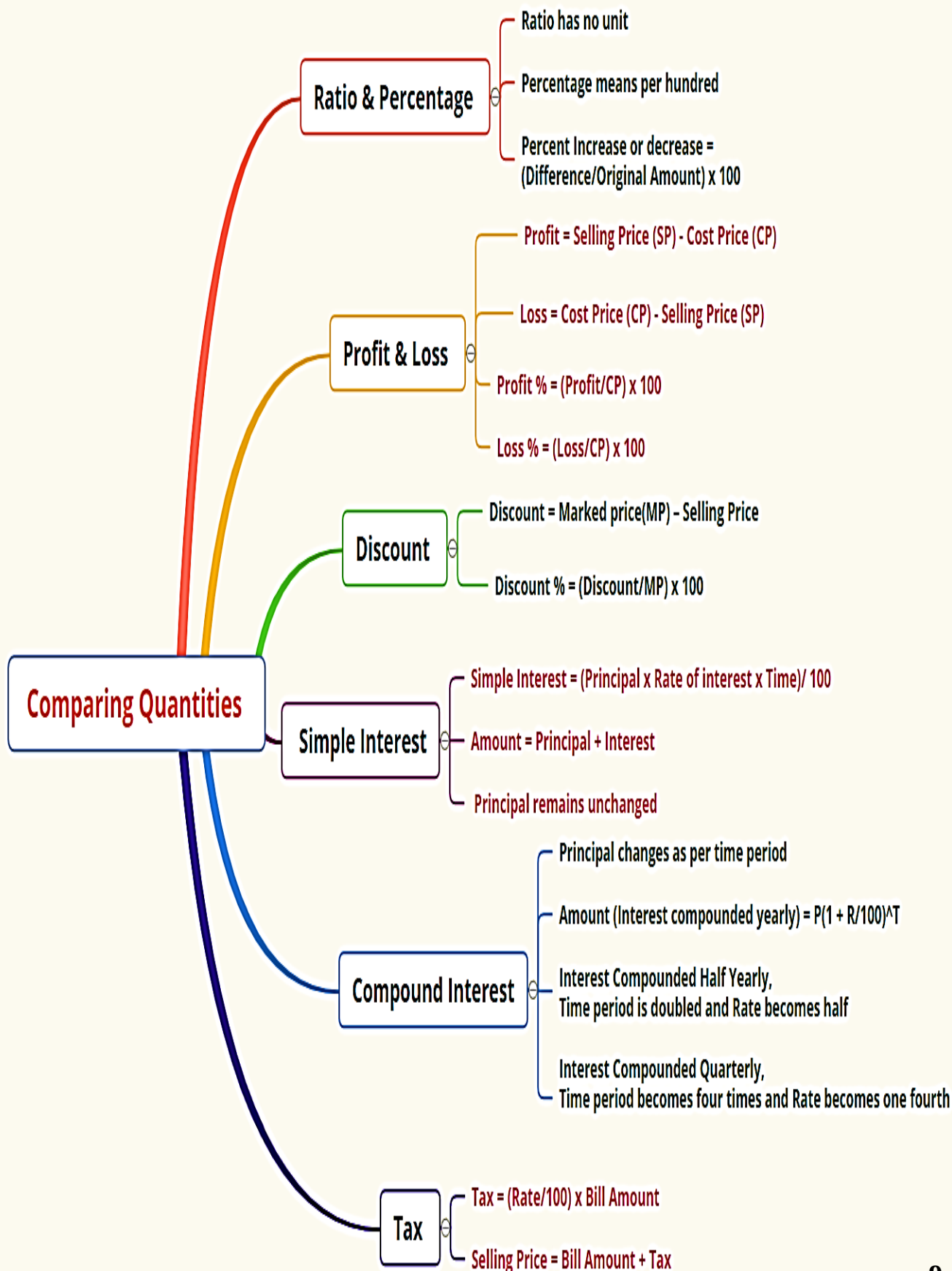
(36 Years old)

Female Banker

An active, witty and smart banker

(28 Years old)







Glossary

1. **Overhead Expenses** - The additional expenses on transportation, labour commission etc. which are included in the cost price.
2. **Marked Price** - The price written or tagged with the article.
3. **Discount** - The reduction given on the Marked Price.
4. **Goods and Service Tax (GST)** - The tax charged on supply of goods or services or both.
5. **Interest** - The additional money paid by borrower or lender on the principal.
6. **Simple Interest** - The type of interest in which the principal remains same throughout the period.
7. **Compound Interest** - The type of interest calculated on the previous year's amount.

Height Quotient

It is summer break in school. Ansh and Anvi are happy spending their time with family and playing in the garden.



Hey, Anvi! Look at the tree! It is laden with ripe guavas.

Oh, I love guavas!



Let's see who can reach up to pluck them.

Of course me! I am the taller one. See, I got them.



No, bhai! you are not taller than me.





Come, let's measure our heights and compare who is taller.

Let's Go!



Your height is 134 cm. Now, it's my turn.

Your height is 132 cm. It means you are shorter than me by 2 cm.



Oh! but I look taller than you.

Now, let's compare our heights using ratio.

Look, the ratio of our height is $67:66$ means I am just 1 unit shorter than you .

Ha! Ha! Ratio has no unit.

Ok, I admit. I am a bit shorter than you.

Percent Platter

Ma, we are feeling hungry!!

Your breakfast is ready!

Wow! My favourite idlis ! But why are they not as fluffy as you always cook them?

Yes, Ma. Why is it so?

These idlis still taste delicious, Ma!

Yes, I think today the percentage of ingredients used in my recipe was not proper.



Ma, what is the usual percentage of ingredients that you use while preparing idli?

Ansh, it is said that for great idlis, get the ratios right. I keep the ratio of $\frac{3}{4}$ cup of Rawa which is equal to 75% of a cup, $\frac{1}{2}$ cup of curd, and $\frac{1}{2}$ cup of water that make 50% of a cup for each.



Mmm..I am confused!
How is $\frac{3}{4}$ of a cup is
same as 75%?

Yes, Ma. I am
confused too.
Please explain.



Let me make it simple
for you. So, when you
have to convert
anything into percent,
we multiply it by 100.



Here, to convert $\frac{3}{4}$ into percentage we multiply it by 100. So, the solution will be $\frac{3}{4} \times 100\% = 75\%$



Oh! That means, you have used only 25% of curd instead of 50% of curd.

As I had less quantity of curd available, I could use only $\frac{1}{4}$ of a cup for making idlis.



It was really interesting
to learn how we can
apply simple math to
cook food too.

100 %
correct!!



Children, now quickly finish
your breakfast and spend
some time with Dadaji.

Ok Ma!!



Worksheet 1

Hi, Anvi and Ansh, I am your friend Stuart. You want to know how do I look like, just colour me as per the numbers and find out.

Here is the colour code.

	1
	2
	3
	4
	5

				1	1	1	1	1	1	1	1				
			1	1	1	3	3	3	3	1	1	1			
		1	1	1	3	3			3	3	1	1	1		
	1	1	1	3	3					3	3	1	1	1	
	4	4	4	3			4	4			3	4	4	4	
	4	4	4	3			4	4			3	4	4	4	
	1	1	1	3	3					3	3	1	1	1	
	1	1	1	1	3	3			3	3	1	1	1	1	
	1	1	1	1	1	3	3	3	3	1	1	1	1	1	
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4	4	2	2	2	2	2	2	2	2	2	2	2	2	4	4
	4	2	2	2	2	2	2	2	2	2	2	2	2	4	
				4	4					4	4				
				4	4					4	4				
				4	4	4				4	4	4			

You have discussed a lot about Ratio and Percentage . Let me test your knowledge.

- Find the ratio between the total number of blocks forming
 - my eyes and my smile
 - my hands and my legs
- What is the percentage of my legs and hands in my body?

Price Dynamics

Petrol price has again gone up. The headline in the newspaper says, "Hike of 10% in the petrol price."

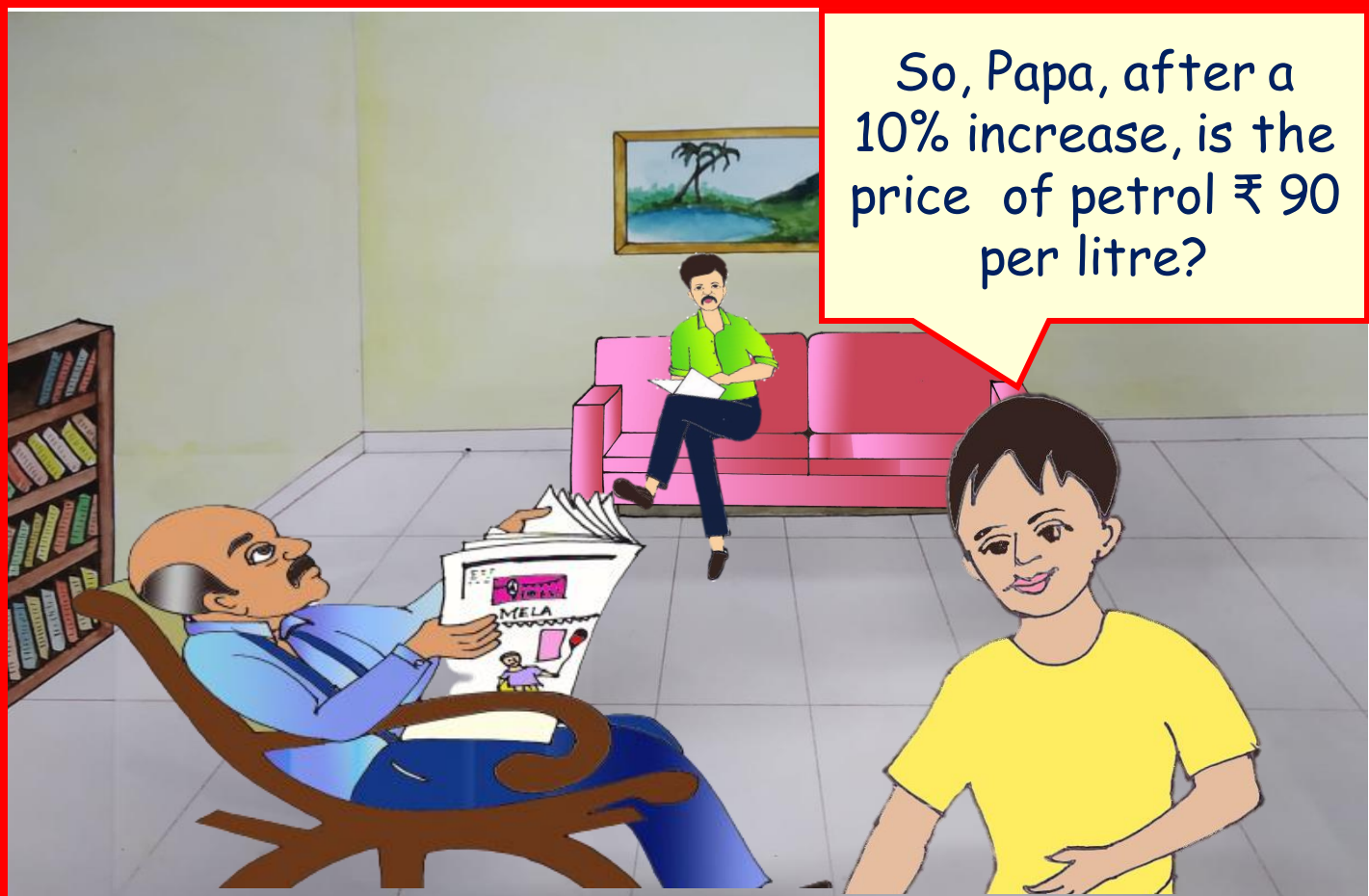


A few days back, it was ₹ 80 per litre and now it has been raised again!!



Oh, no!
Increase in petrol price will result in price rise of other commodities too.

So, Papa, after a 10% increase, is the price of petrol ₹ 90 per litre?



Dear Son!
A rise of
10% is not
₹ 10.



Children, to calculate the increase in percentage, we calculate 10% of the previous price and then add the result to it.



Let me check your understanding.
If the earlier price was ₹ 80 then
what will be 10% of ₹ 80 ?

₹ 8



Right, so the
new price will
be.....

$$₹ (80 + 8) \\ = ₹ 88$$

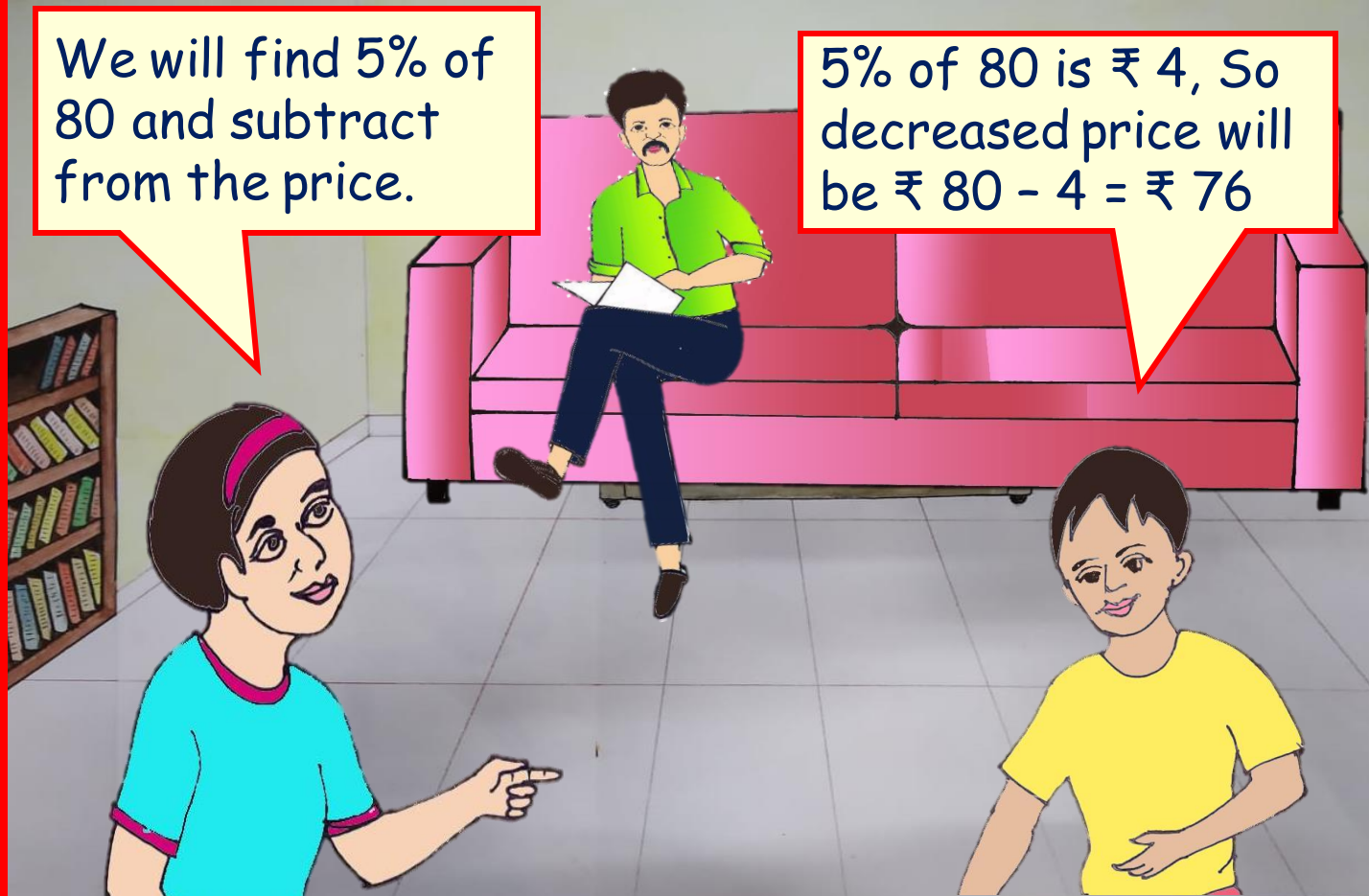


Tell me if there is a
decrease of 5% then
what will you do?



We will find 5% of 80 and subtract from the price.

5% of 80 is ₹ 4, So decreased price will be ₹ $80 - 4 = ₹ 76$



Excellent Kids!!

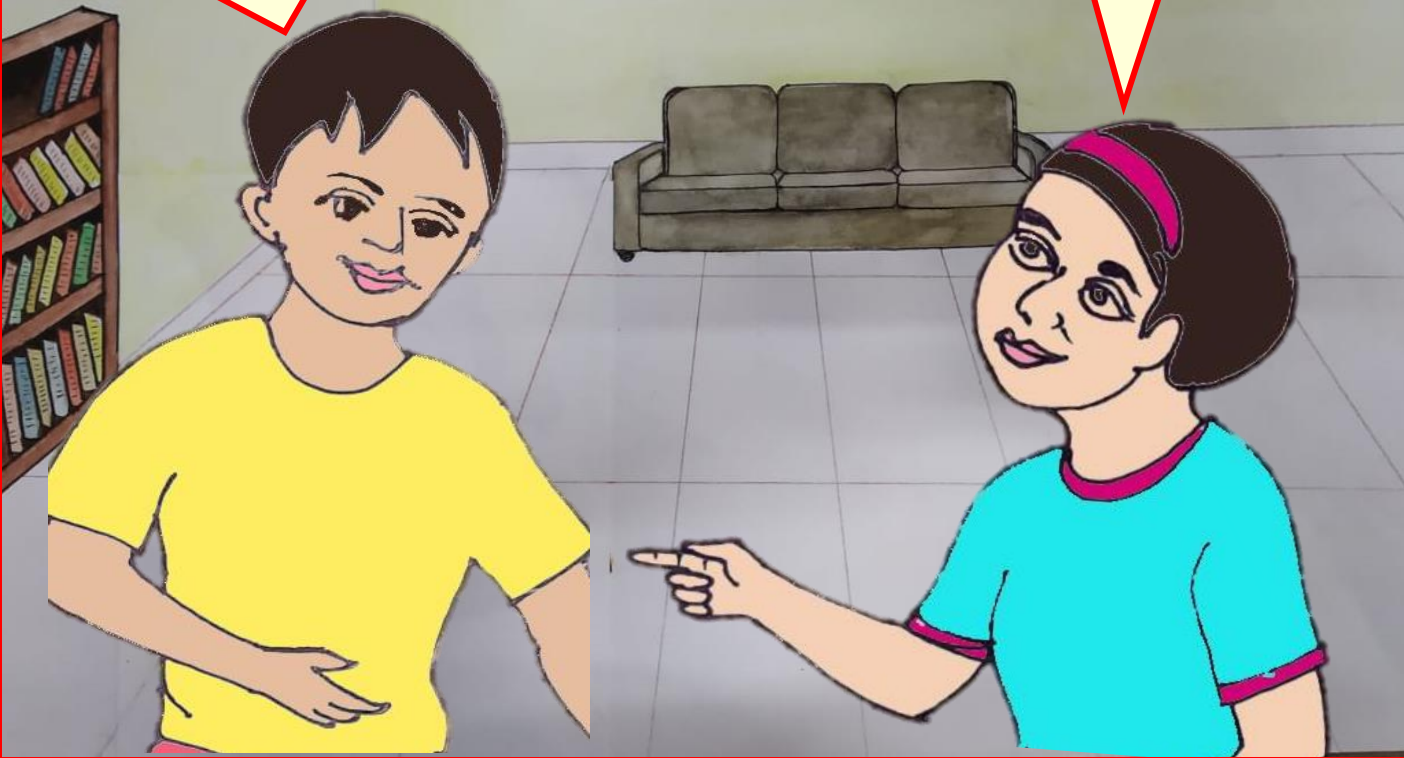
Children you rock!!

Thank you Dadaji.



Anvi, wasn't it fantastic to learn Increase and Decrease percent in such a simple way?

Absolutely



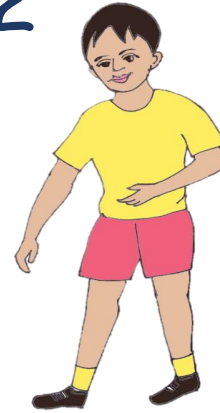
Increase or decrease % = $\frac{\text{Difference}}{\text{Original value}} \times 100$

If Original price is ₹ 80 and increased price is ₹ 88, difference in price is ₹ 8 then

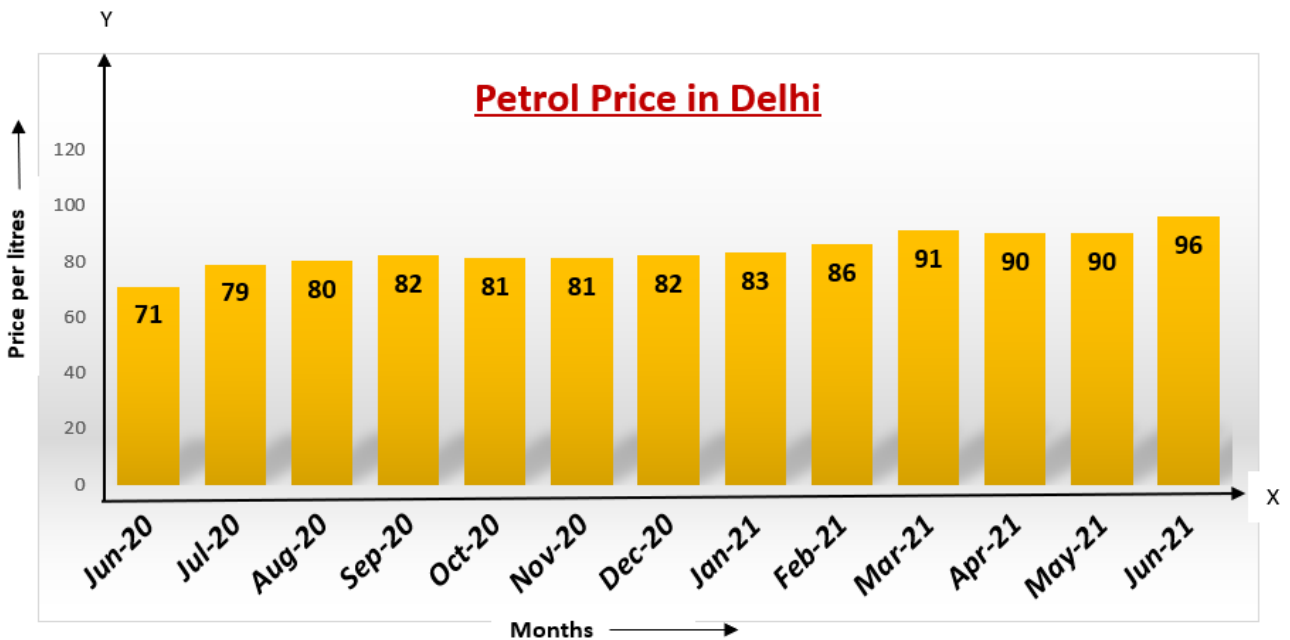
$$\text{Increase \%} = \frac{8}{80} \times 100 = 10 \%$$

Similarly, we can calculate decrease %.

Worksheet 2



On the basis of your discussion with your grandfather about the petrol price, I have prepared a graph for you, depicting the petrol prices in Delhi from June 2020 to June 2021. Read the bar graph carefully and answer the questions that follow:



1. From August 20 to September 20, what is the increase percent of the price of petrol?
2. What is the percent of decrease in price from Mar 21 to May 21?

The Fair Experience

One fine day...



I am excited to tell that the Annual Fair has started !!



Hurrah!!
Dadaji
Let's go
there.

Yes,
Dadaji. I
am equally
excited.



What are my children
planning today?



Ma, we are planning to
visit the fair with
Dadaji.



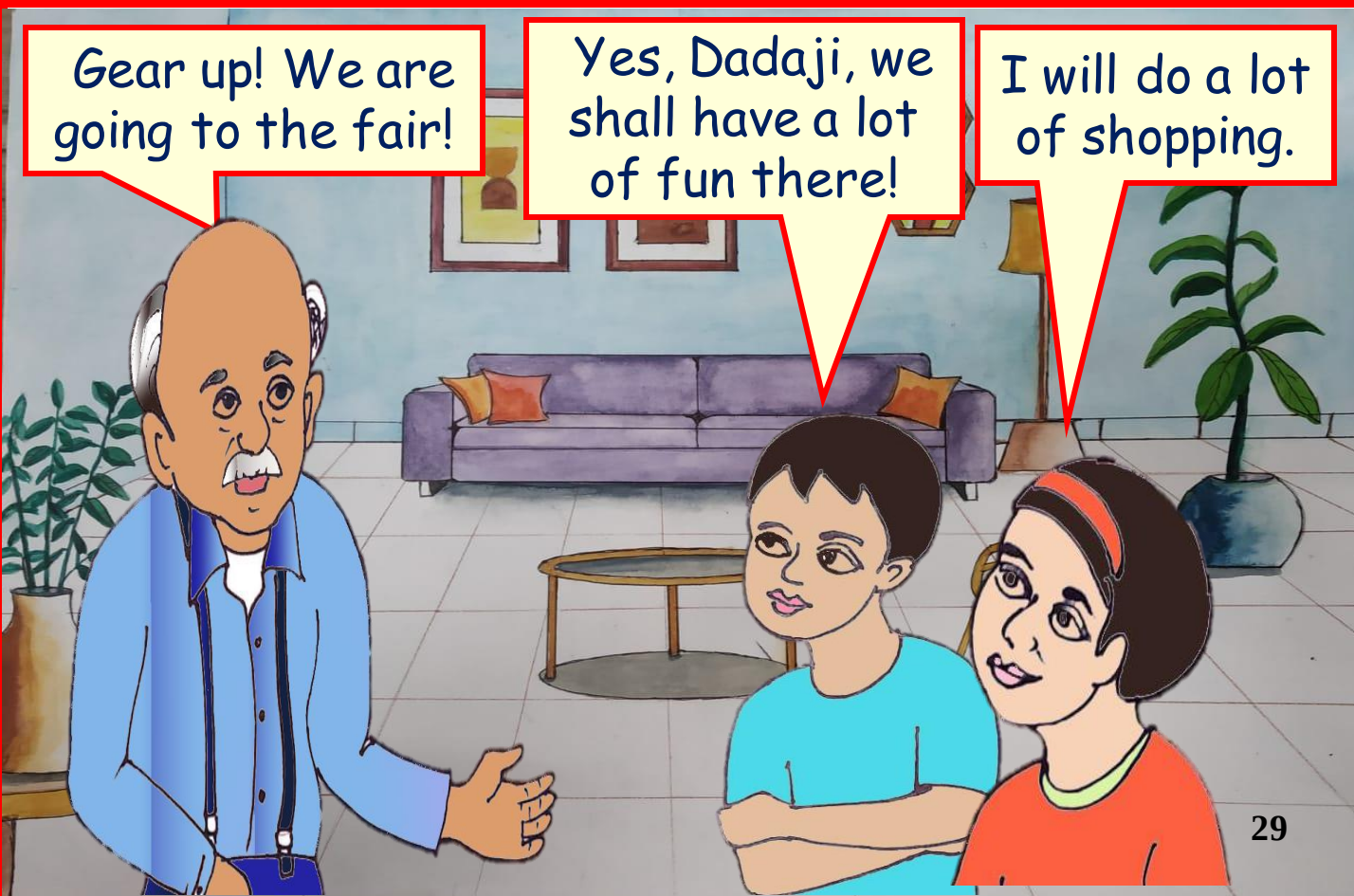
Wow ! It seems that you are going to enjoy a lot.



Gear up! We are going to the fair!

Yes, Dadaji, we shall have a lot of fun there!

I will do a lot of shopping.



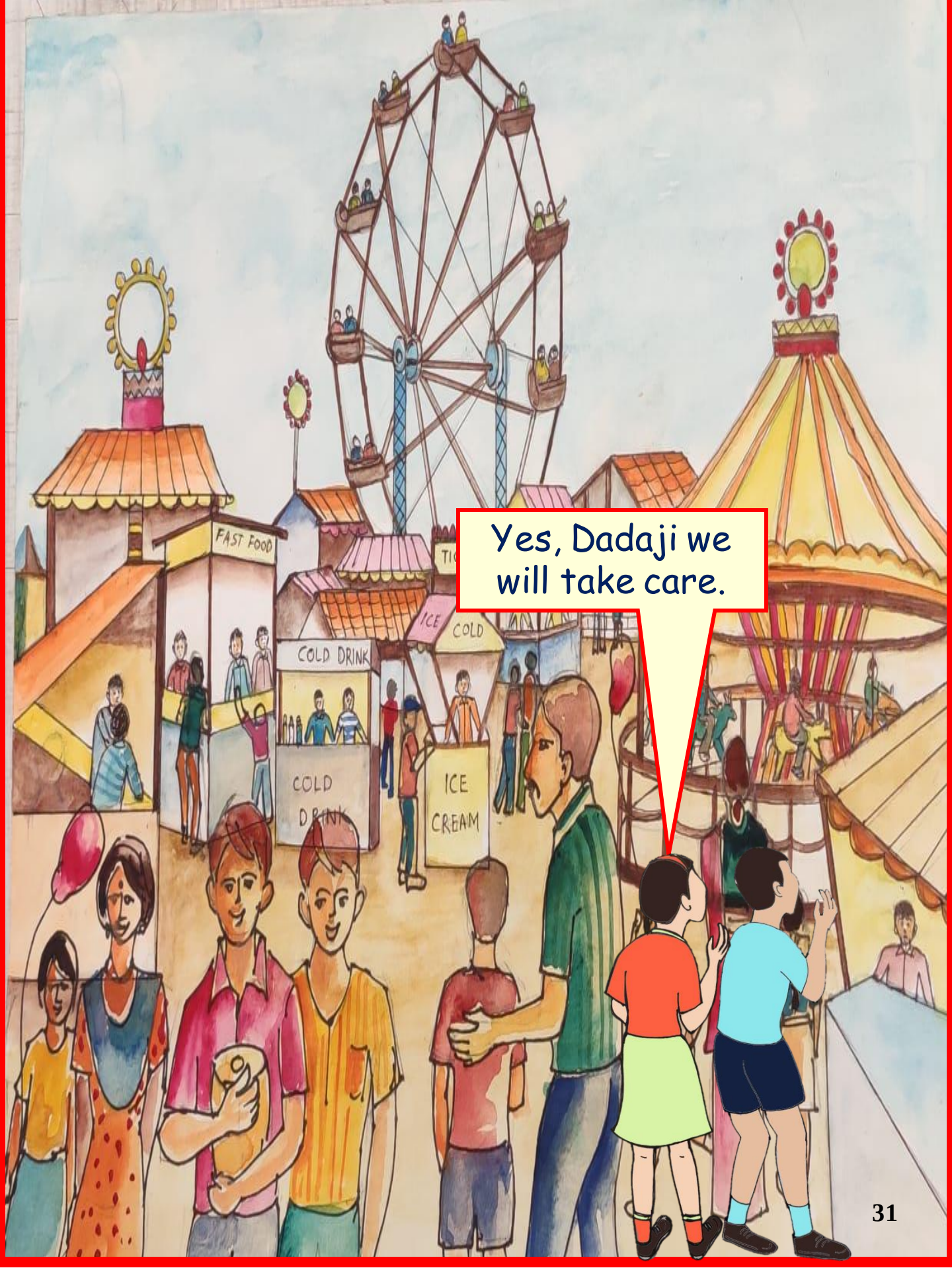
At the fair



WOW!! This is wonderful.

Both of you can go and enjoy the rides but remember to stay together and ride safely.

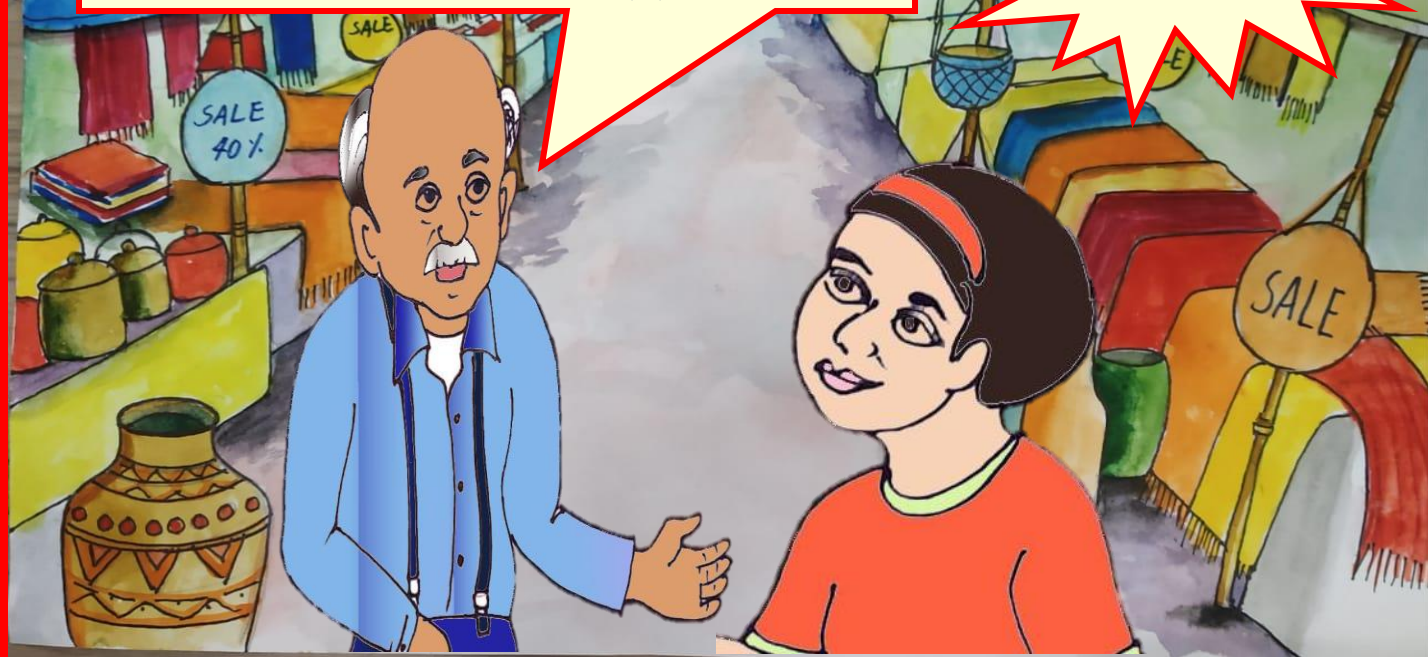




Yes, Dadaji we
will take care.

Hope you both had fun. You must be feeling hungry now. Let's eat something and then we will do some shopping.

Hurrah!!



At the food stall

It is delicious
Dadaji!

Yes, but not more
delicious than the
food cooked by our
Ma.



Let's go for shopping now.

I want to purchase a toy.

Me too..

At the Toy Shop

How may I help you?

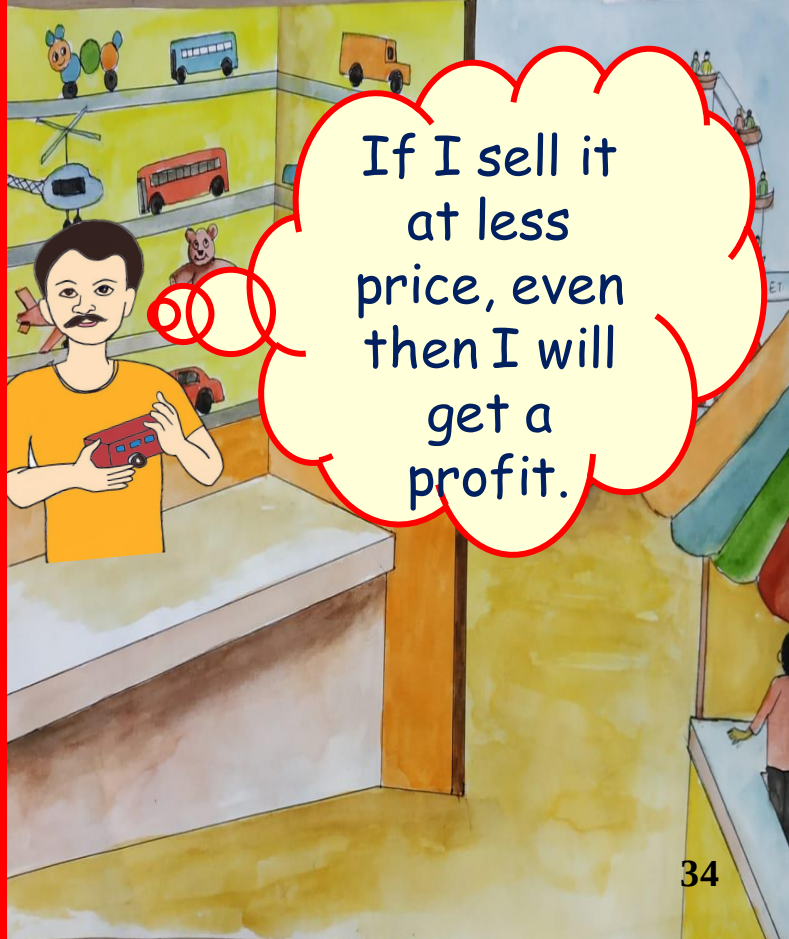
Uncle!! Can you please tell me the price of that car?

That one? Its price is ₹ 400.



No! No! ₹ 400 is very high.

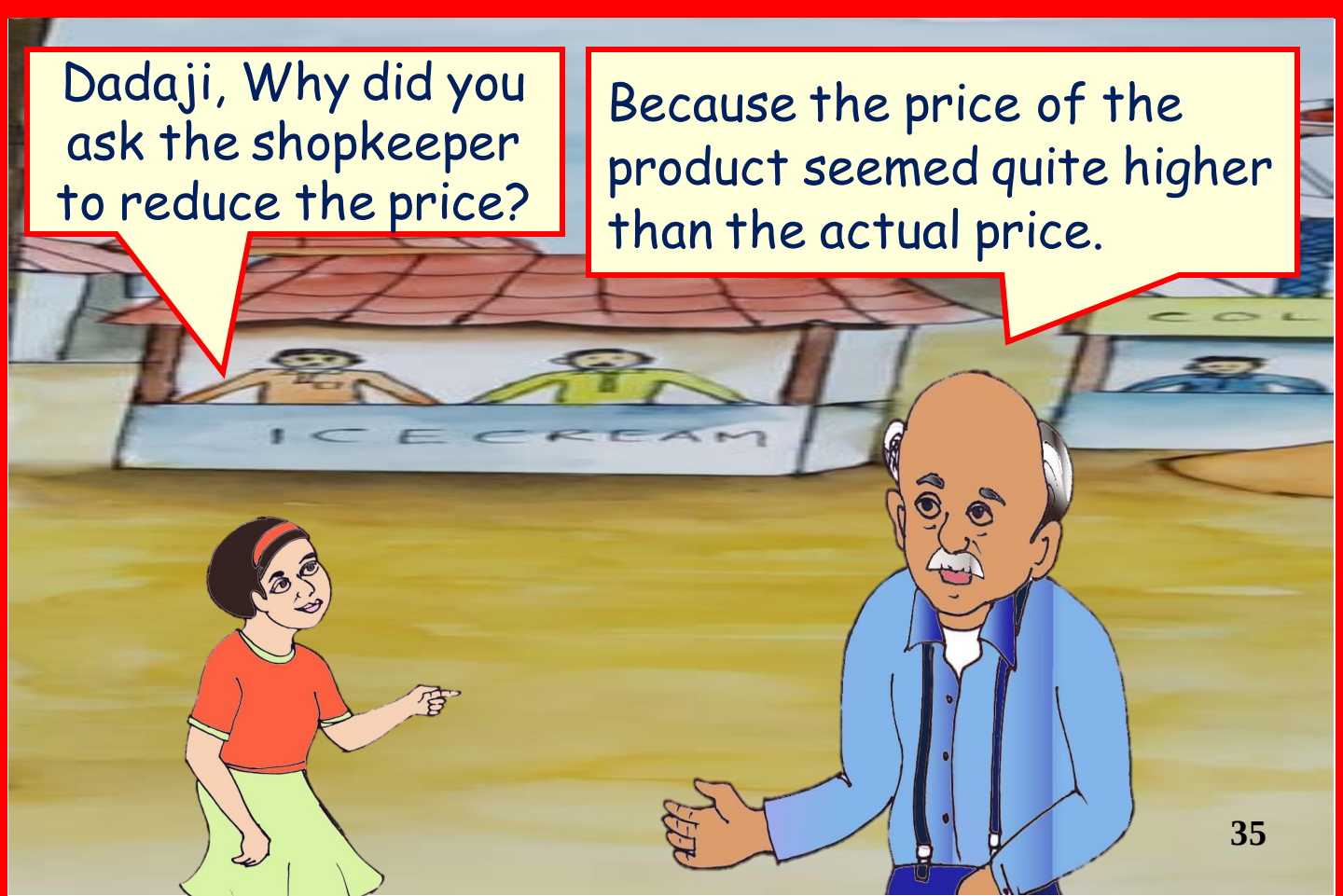
If I sell it at less price, even then I will get a profit.





Alright, I am ready to
sell at ₹ 300.

Fine.
Please pack
that.



Dadaji, Why did you
ask the shopkeeper
to reduce the price?

Because the price of the
product seemed quite higher
than the actual price.

Do you know the price at which they purchase the article is the Cost Price of the article and the price at which they sell it is the Selling Price.

Yes Dadaji.



Our teacher taught us SP and CP.

Whenever $SP > CP$ the shopkeeper earns a profit and if $SP < CP$, they bear a loss.

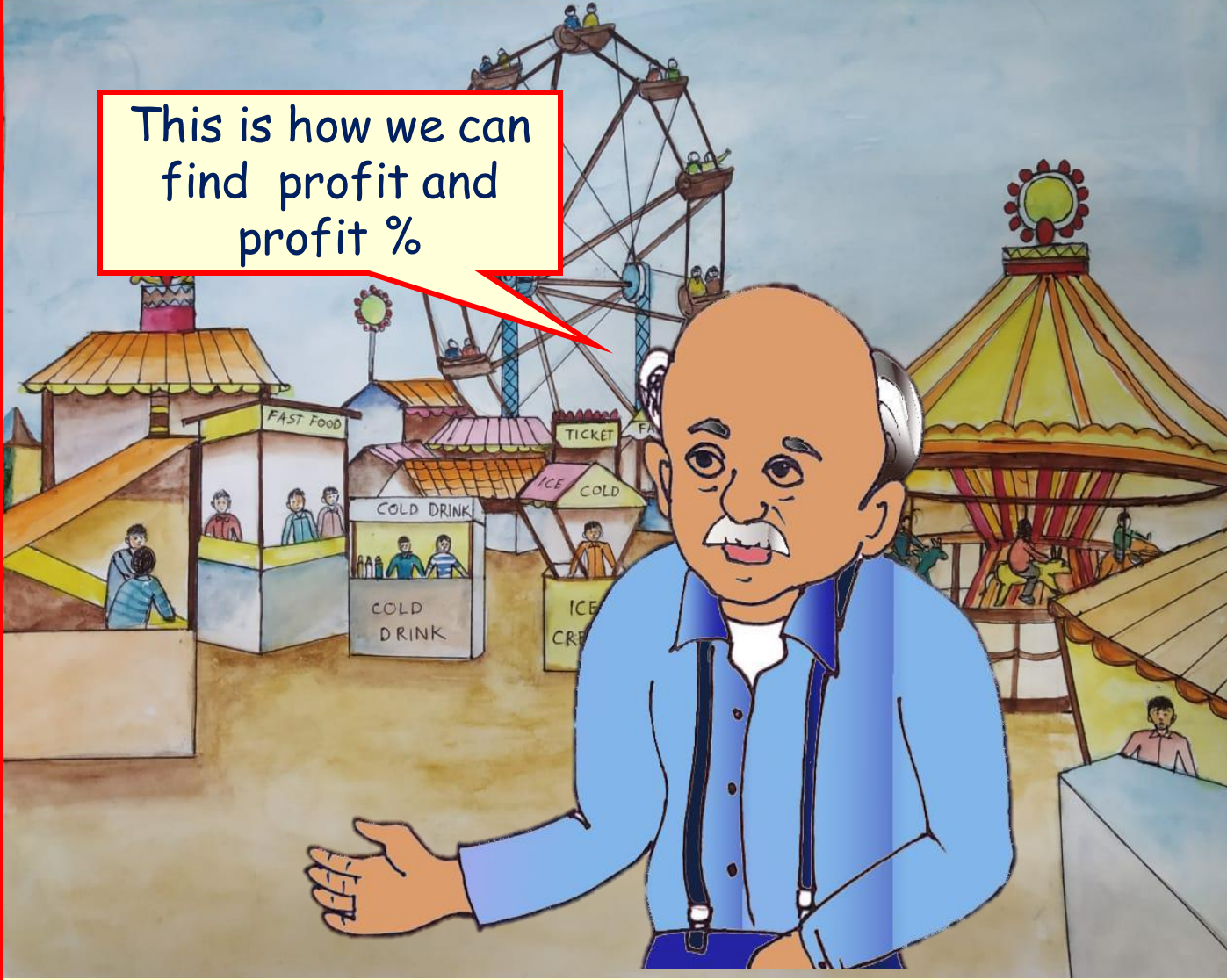


That means in our case the shopkeeper wanted to earn higher profit.

Exactly!
Hence, I bargained



This is how we can
find profit and
profit %



CP of an article = ₹ 300

SP of the article = ₹ 400

Profit = SP - CP = 400 - 300
= ₹ 100

Profit % = $\frac{P}{CP} \times 100$

$$= \frac{100}{300} \times 100 = 33\frac{1}{3} \%$$

Anvi, let's purchase a shirt for Papa.

Yes, we will purchase a green-coloured shirt.

UP TO 50%

FLAT 50%

Good idea, that is Papa's favourite colour.

Look, there are two shops with discount boards, which one should we choose?

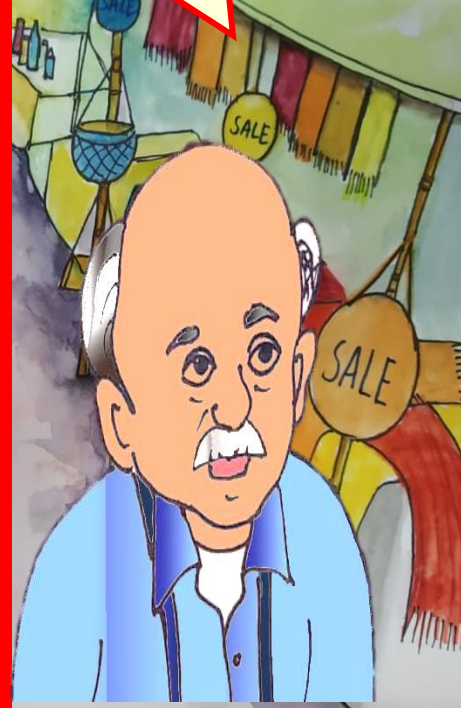
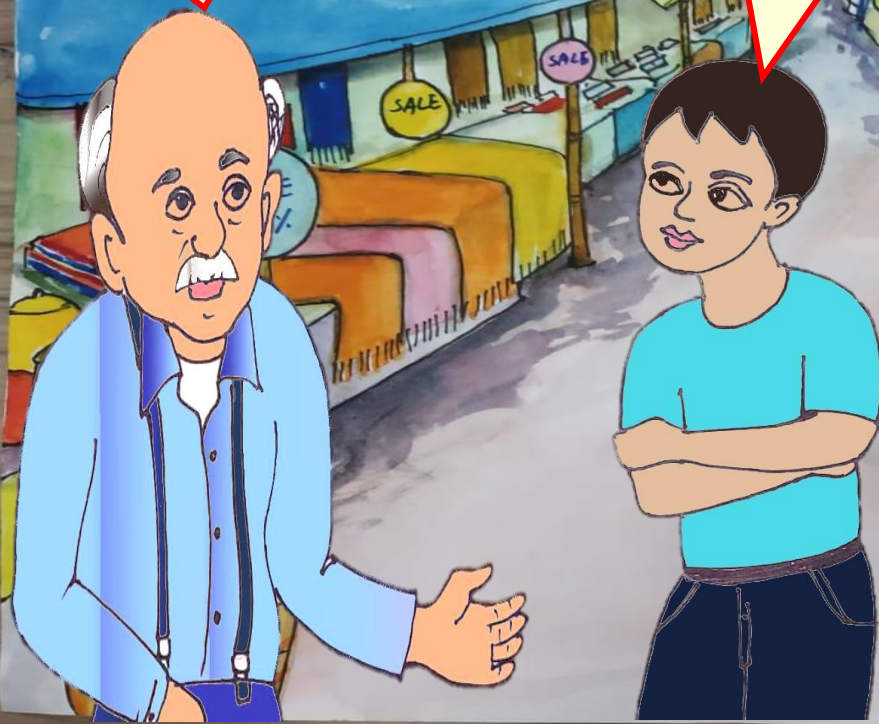
UP TO 50%

FLAT 50%

Find out yourself.

How Dadaji?.

I will explain it.



Discount is a reduction given on the Marked Price(MP). See, there are tags on the items, for example a shirt marked at ₹ 800 will cost you ₹ 400 after 50% discount.

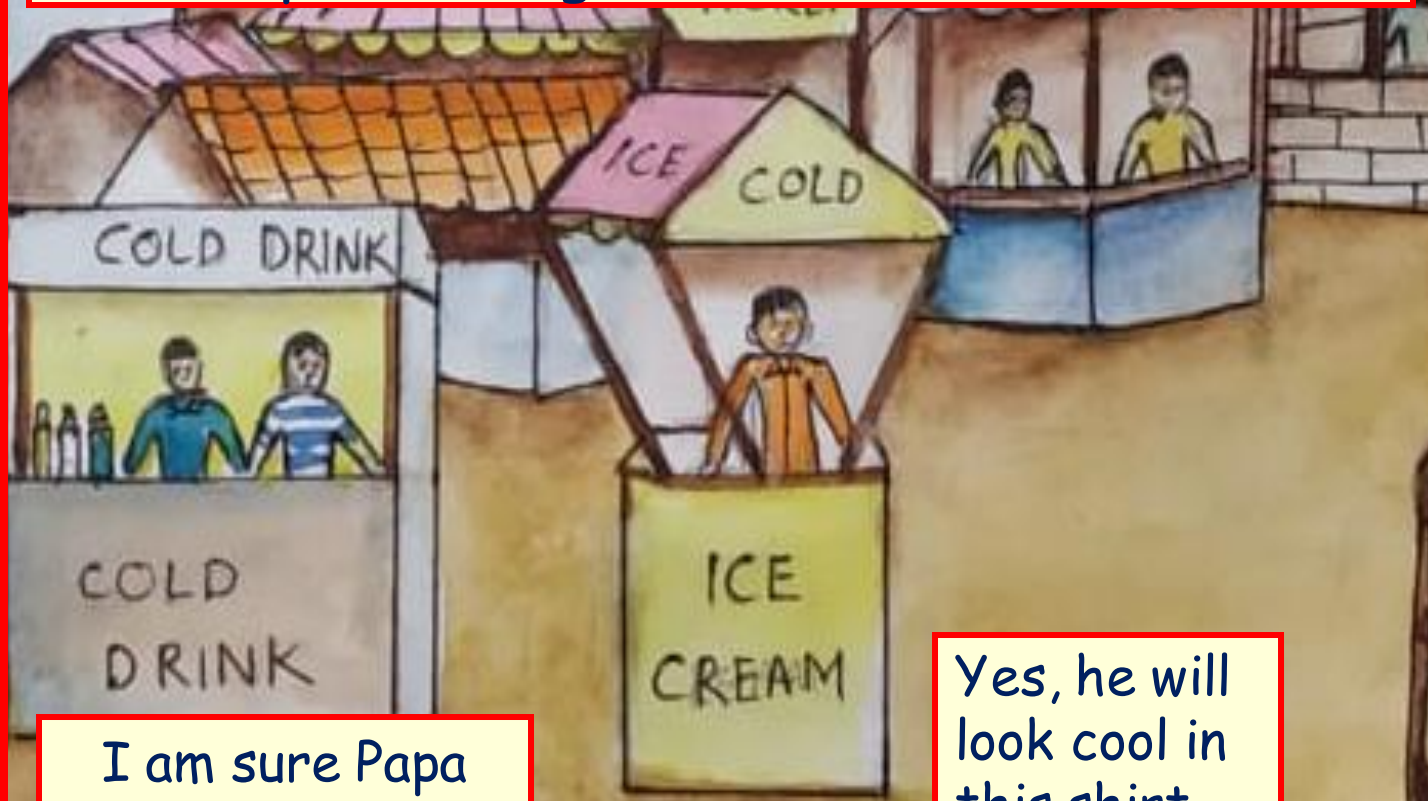




And the one giving the discount up to 50% can cost you more than 400 also. Now you tell me, from which shop will you purchase?

We will go to the shop which offers flat 50% off.

After purchasing the shirt



I am sure Papa will like the shirt.

Yes, he will look cool in this shirt.



Wisdom Speaks

After purchasing the shirt, Ansh and Anvi explore Handicraft Shop.



Dadaji! I want to purchase something for Ma also.

Ok, let's choose something for her..



That bag is so beautiful!

Yes, that is perfect for Ma.





Uncle, how much does the bag cost?



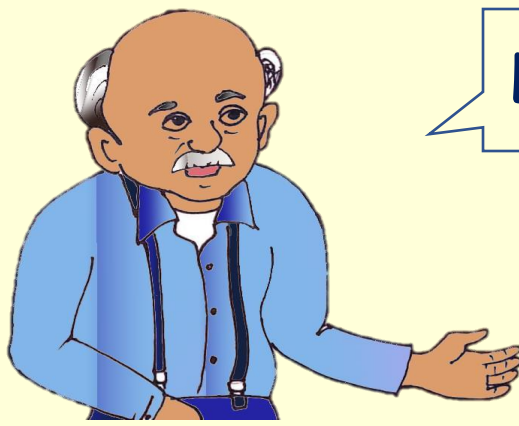
It costs ₹ 500 including GST.



Now what is GST?

GST stands for Goods and Services tax which is taken on the supply of goods or services or both. Whenever we purchase any item, we have to pay GST.

Dadaji
please explain
in detail.



Listen

Suppose

Price of an article (without GST) = ₹ 500

Rate of GST = 5%

Total price of the article to be paid including GST =
₹ 500 + 5 % of 500

$$= ₹ 500 + \frac{5}{100} \times 500$$

$$= ₹ 500 + ₹ 25$$

$$= ₹ 525$$

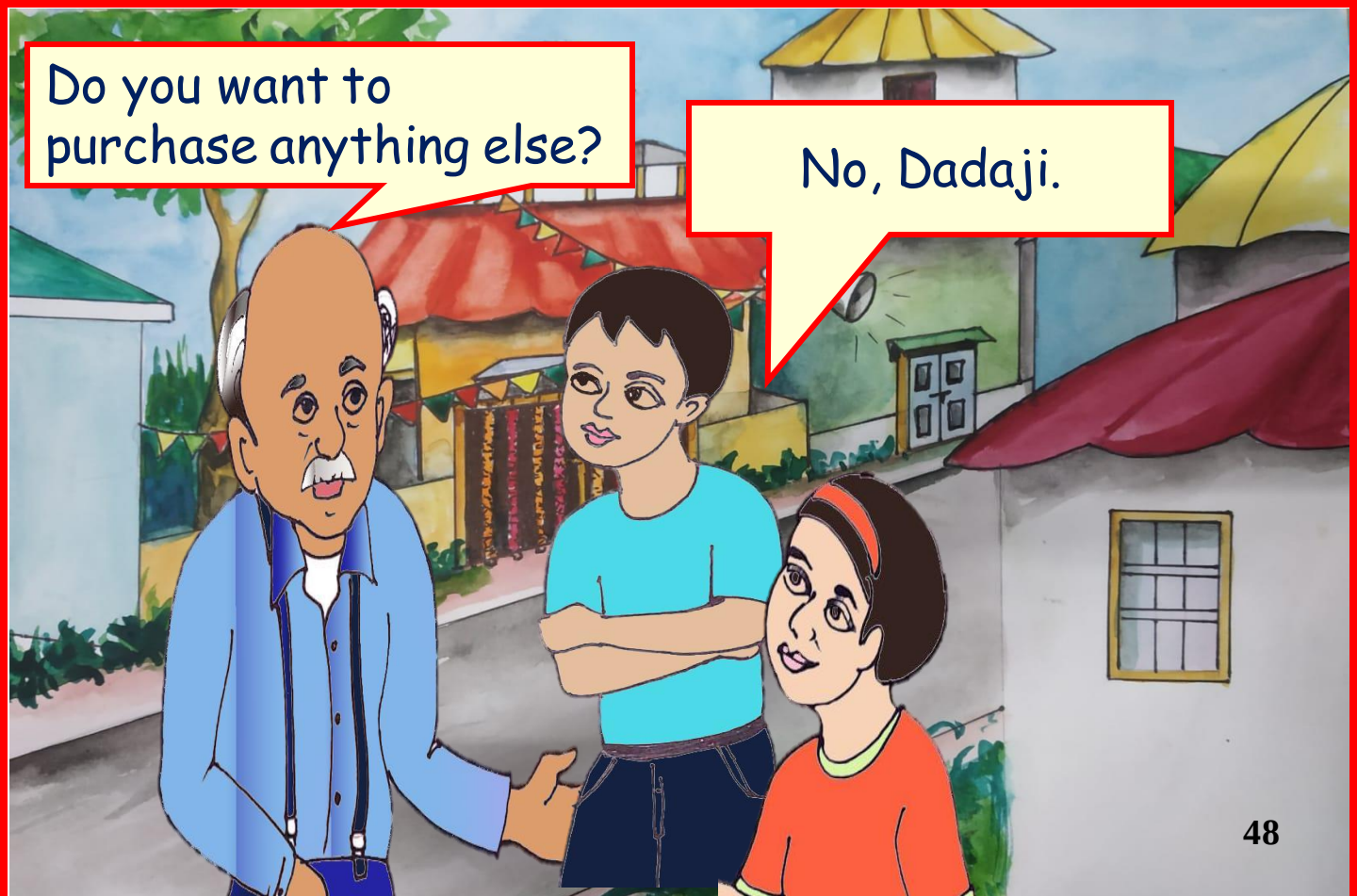
From July 1, 2017, Government of India introduced GST which stands for Goods and Services Tax which is levied on supply of goods or services or both.



A man with a white mustache and a blue shirt is standing behind a market stall. He is holding a small cup. A young boy with dark hair and a blue shirt is standing in front of him, looking at the stall. The stall is filled with various items, including colorful fabrics, baskets, and a small lantern. The background shows more market stalls and a building with a yellow roof.

Excellent! Now you have understood.

Here, we don't have to pay extra as the price includes GST.

A man with a white mustache and a blue shirt is standing on a street. He is talking to a young boy with dark hair and a blue shirt, who has his arms crossed. A young girl with dark hair and a red shirt is standing next to the boy, looking at the man. The background shows a street with buildings, trees, and a red awning.

Do you want to purchase anything else?

No, Dadaji.



Ok, OK, Let's Go.

Dadaji, I am tired, let's go home now.



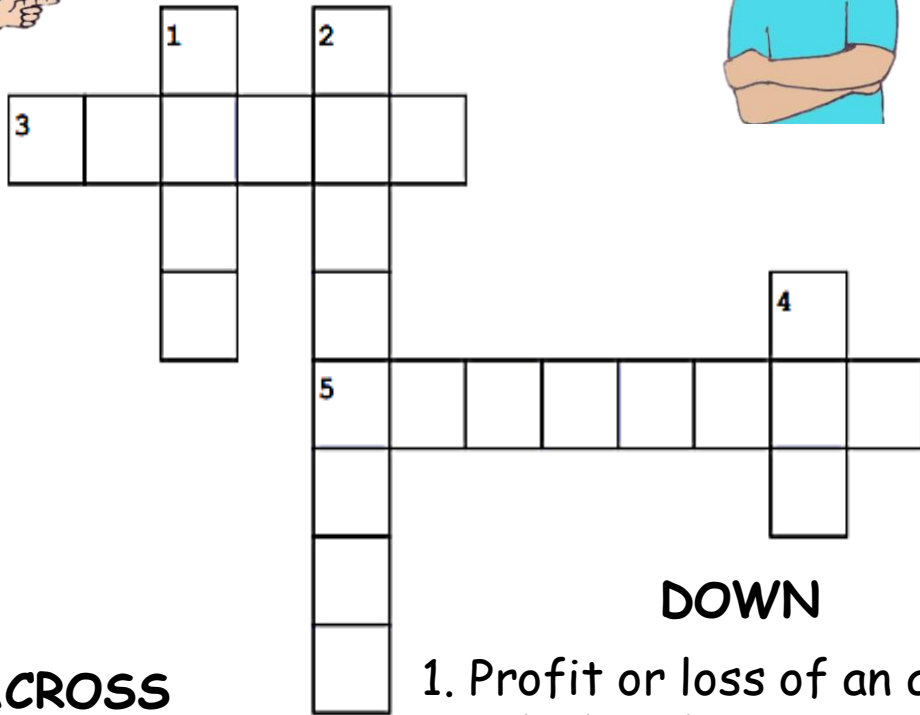
I hope you had fun.

Yes, Dadaji it was fun filled day.

Worksheet 3



Let's solve
this crossword



ACROSS

3. Ravi purchased an article at ₹ 560 and sold it at ₹ 580. He will have a _____ of ₹ 20.

5. Sanjay purchased a property at ₹ 60, 00000. He spent ₹ 100000 on its interior. The additional expense made after buying are known as _____ expenses.

DOWN

1. Profit or loss of an article is calculated using _____ price of the article.

2. During the festivals shopkeepers give a heavy _____ on the Marked Price to attract customers.

4. Ajay went to a restaurant and had a meal of ₹ 520. He paid ₹ 572 at the bill counter. The extra ₹ 52 are for the _____ on the actual bill.

Fill in the blanks:

1. _____ is the reduction in the marked price of the article.
2. 0.1% of $m = 10\%$ of n , then $m = \underline{\hspace{1cm}}n$.
3. If the ratio of $CP : SP$ is $5:6$, then gain % will be _____.
4. Selling price of a Laptop bought at ₹ 25000 at a profit of 10% will be _____.
5. Cost price of an article that is sold at ₹ 40.60 after gaining 10% on it will be _____.
6. Marked price of a saree sold at ₹ 9720 after allowing a discount of 20% on the eve of Gandhi Jayanti will be _____.
7. If a number is increased by 20% and then decreased by 20% , then the Net increase or decrease % in the number will be _____.
8. Marked price of a computer available at ₹25,290 including 8% GST will be _____.

Worksheet 4

Solve & tick on the correct option

1. Mom prepared 18 kg of Ladoo by mixing Khoya with sugar in the ratio of 7: 2. How much Khoya did she use?

a. 4 kg

b. 6 kg

c. 8kg

d. 14 kg

2. On selling an article for ₹ 200 there is a gain of ₹ 20, which of the following is the gain%?

a. 10.5%

b. 22.2 %

c. 20.3 %

d. 11.1 %

3. Cost price of a Mobile Phone is ₹ 25000. Tax applicable on the phone is 18 %. Its Selling Price will be

a. ₹ 20600

b. ₹ 29600

c. ₹ 29500

d. ₹ 29509

4. After increasing 15 % of the price of an article, it becomes ₹ 1725. The price before increase was

_____ a. ₹ 1500

b. ₹ 1525

c. ₹ 1545

d. ₹ 1575

5. An antique piece is sold for ₹ 1200 at a gain of 25% then cost price will be

a. ₹723

b. ₹ 823

c. ₹ 923

d. ₹ 960

6. A table fan is marked at ₹ 1540. During a sale discount was given and it was sold at ₹ 1463. Tick the correct discount %

a. 4 %

b. 5 %

c. 6 %

d. 7 %

7. The C.P of 21 articles is equal to the S.P of 18 articles . Gain% or loss% in whole transaction will be

a. $12\frac{1}{2}$ % gain

b. $12\frac{2}{3}$ % loss

c. $16\frac{2}{3}$ % gain

d. $16\frac{3}{4}$ % loss

8. In a stock clearance sale, all goods were sold at flat 30 % discount. If the marked price of the shirt is ₹ 600 then the selling price will be

a. ₹200

b. ₹ 400

c. ₹ 410

d. ₹ 420

9. The final Bill of a refrigerator whose marked price is ₹ 37500 and is charged with 10 % tax will be

a. ₹ 42000

b. ₹ 41250

c. ₹ 42150

d. ₹ 45120

10. On selling a camera for ₹ 5000, the seller gains 25 %. CP of the camera will be

a. ₹ 2000

b. ₹ 3000

c. ₹ 4000

d. ₹ 2500

Matter of Interest

Where are you going Papa ?

Today I am going to the Bank for some work.

We also want to join you.

Okay, then get ready in 10 minutes.

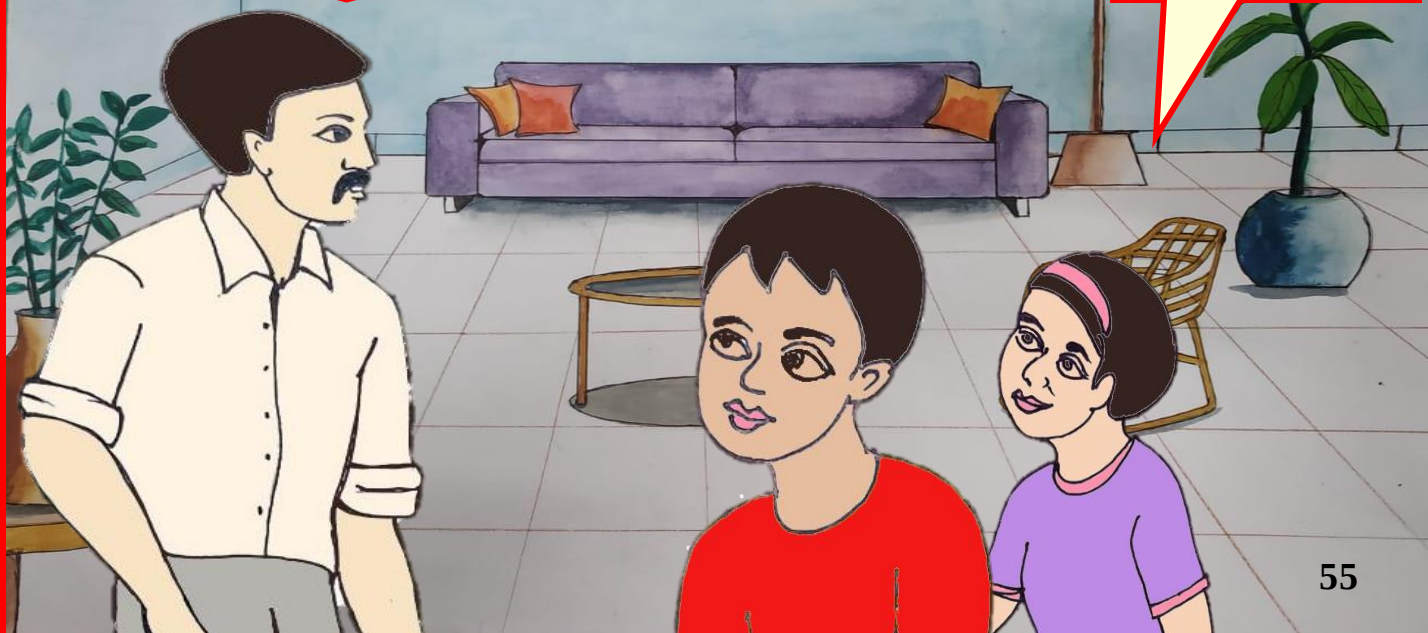
Do you know why I am going to the Bank ?

No Papa, please tell us.



You must have heard about the different rates of interest like @ 9% p.a. or saving account with interest @ 5% p.a.

Papa, please tell us more about this.



Interest is the extra money paid by bank or an institution or post office on the money deposited with them which is called Principal.



Papa, how do we calculate the Interest?

There are two types of Interest- Simple and Compound.



Yes, Papa now I can recall our teacher also taught us this concept.



OK dear, So what was the formula?



$$\text{Interest} = \frac{P \times R \times T}{100}$$



Absolutely Right!!



Also, Amount = Principal + Simple Interest



Then papa , what is Compound Interest and how is it different from Simple Interest?



In Simple Interest, Principal always remains same.



In Compound Interest the Principal changes as per the time period.



Could you tell us what it means??

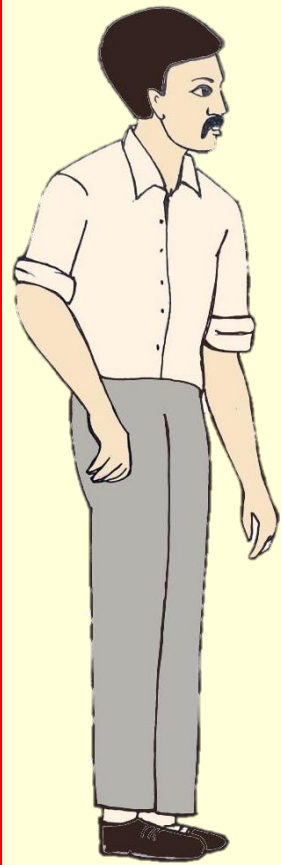


In Compound interest as interest is added to the Principal so the Amount becomes the Principal for the next time period.

It means Principal is not the same for every time period.

Yes , it keeps on increasing.





**We calculate
CI as..**

The Compound Interest on ₹ 1000 at the interest rate of 5% for a time period of 2 years will be calculated using

$$A = P \left(1 + \frac{R}{100} \right)^n$$

$$A = 1000 \left(1 + \frac{5}{100} \right)^2$$

So, Amount = ₹ 1102.5

and CI = ₹ (1102.5 - 1000)
= ₹ 102.5

**Compound
interest
grows your
money faster**



Ansh & Anvi reach bank with their father



Good Morning, ma'am,
I am here to invest
my money.

Sure sir, let
me show you
the plans.



INVESTMENT PLANS

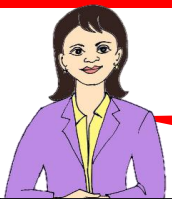
PLAN A - RATE OF 10% COMPOUNDED
ANNUALLY

PLAN B - RATE OF 10% COMPOUNDED
HALF YEARLY



I would like to invest
₹ 1,00,000 for 3 years.
Could you tell me the
calculations of amount?

Sure,
Sir.



These are the calculations.

Plan A
(Compounded annually)

Principal = ₹ 1,00,000
Rate of interest = 10 % p.a

Time = 3 years

$$\text{Amount} = A = P \left(1 + \frac{R}{100} \right)^n$$

$$\begin{aligned} A &= 100000 \left(1 + \frac{10}{100} \right)^3 \\ &= 100000 \left(1 + \frac{1}{10} \right)^3 \\ &= 100000 \left(\frac{11}{10} \right)^3 \\ &= 100000 \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10} \\ &= ₹ 1,33,100 \end{aligned}$$

$$\begin{aligned} \text{C.I} &= A - P \\ &= 133100 - 100000 \\ &= ₹ 33100 \end{aligned}$$

Plan B
(Compounded semi annually)

Principal = ₹ 1,00,000
Rate of interest = 10% p.a
 $= \frac{10}{2} = 5\%$

Time = 3 years = 3 x 2 years
= 6 half years

$$\text{Amount} = A = P \left(1 + \frac{R}{100} \right)^n$$

$$\begin{aligned} A &= 100000 \left(1 + \frac{5}{100} \right)^6 \\ &= 100000 \left(1 + \frac{1}{20} \right)^6 \\ &= 100000 \left(\frac{21}{20} \right)^6 \\ &= 100000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20} \\ &= ₹ 1,34,010 \text{ (approx.)} \end{aligned}$$

$$\begin{aligned} \text{C.I} &= A - P \\ &= 134010 - 100000 \\ &= ₹ 34010 \end{aligned}$$



Invest your
money wisely as
it pays off in
future.

INVESTMENT PLANS

PLAN A - RATE OF 10% COMPOUNDED ANNUALLY

PLAN B - RATE OF 10% COMPOUNDED HALF YEARLY

As per plan A
Amount received = ₹ 1, 33, 100,
means an interest of ₹ 33100
and

As per plan B,
Amount received = ₹ 1, 34, 010,
means an interest of ₹ 34010



That means investing in plan B will be beneficial for me.



Yes, Papa we can also calculate with the formula

$$A = P\left(1 + \frac{R}{100}\right)^n$$

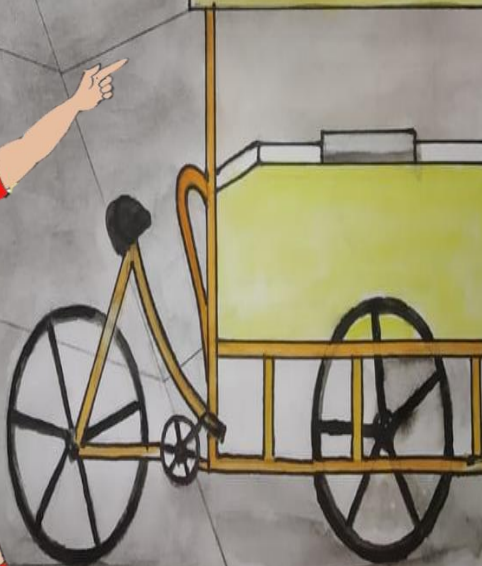
Where, A is amount, P is principal, R is rate of interest and n is time period.

Very Good Children! Now Let's go home.



Papa, can we have ice cream?

ICE CREAM



Of course.

ICE CREAM



I am so happy that you have learnt all the concepts !!



Yes, papa !!

Look at our school building!!
Yes, I am missing my school.



I am waiting for the school to reopen post vacations. I am eager to meet my friends.

Yes, I want to share my experiences and learnings with all of them.



I am glad that both of you have acquired good knowledge during your vacation. Let's go home. Your mother must be waiting for us.



Worksheet 5



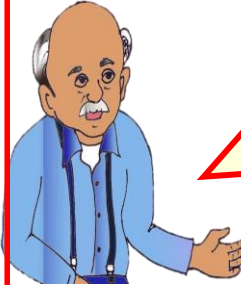
Today I met Rambabu, he needs money for his son's marriage.

He can take loan from the bank.



He is taking loan, but he is confused about deciding the right plan.

Dadaji, can we help him in choosing the right type of plan?



That will be so nice of you. I will apprise you with the different plans and then you can help him choose the best plan.



Yes, Let's see how much you have learned.



He wants a loan of ₹ 100000 for 3 years. These are the plans given by the bank.

Plan A

Type of Interest - Simple

- Rate of Interest = 5%

Plan B

Type of Interest - Compound

- Rate of Interest = 10%
- Compounded annually

Plan C

Type of Interest - Compound

- Rate of Interest = 4%
- Compounded Half Yearly

OK Dadaji, we will calculate the amount for all the three plans and tell the best plan for taking loan.





Ansh, Let's try
these now



Worksheet 6

1. A shopkeeper allows 5% discount on an article. If the selling price is ₹ 280, then find the marked price.
2. A retailer marked the price of a shirt at 16 % more than the cost price. He then gave a discount of 12% on the marked price. Find his loss or gain%.
3. You have invested an amount of ₹ 50,000 for 1 year at the rate of 7.5% per annum compounded annually. If your investment been compounded half yearly, what will be difference between the amount received by you?
4. Mohini buys some clothes from a shop at a discount of 15%. The marked price for the dress was ₹ 3000, the Saree was ₹ 2500 and the pair of jeans was ₹ 1000. How much did she pay in all after the discount?
5. Riyaz bought a TV set marked at ₹ 30000. He got a discount of 10% and paid a GST of 12%. What will be the Selling Price for the TV set?

6. Rahul buys a bicycle for ₹ 3000. The price of the bicycle appreciates at a rate of 5% p.a. What will be its value after 2 years?
7. A shopkeeper allows the successive discounts of 10 % and 20% discounts on mobile phone, whose selling price is ₹ 9000. Find the marked price of the mobile phone.
8. What will be the time required for ₹ 625 to become ₹ 676 at the rate of 4% p.a. compounded annually?
9. The price of a mobile phone depreciates at a rate of 4% every year. If its current cost is ₹ 20000. What will be its price after 3 years?
10. The area of a forest is estimated to be 400000 sq. miles. If its area decreases at a rate of 6% each year, Find its area after 2 years.



**EARN
SAVE
INVEST !!**

Enrichment Activities

Activity 1:

Record the monthly expenses of your family for two months on various items as per the given format (Discuss with your parents). Entries can be changed according to your requirements. Calculate the percentage increase or decrease in the monthly expenses. Give some suggestive measures to reduce the expenses.

Description of Expenses	Expenses Month 1	Expenses Month 2	Increase/ Decrease %
Education expenses			
Travelling			
Groceries			
Electricity & Gas			
Phone			
Credit payments			
Others			

Activity 2:

During the festivals newspaper is filled with attractive discount offers.

- Taking idea from newspaper, create a poster highlighting the discounts and offers for a product and give a catchy title to it.
- Find the discount given on the marked price and calculate the price after the discount.

You can create your own designs like the one given below.





Important Formulae

➤ $\text{Increase or decrease\%} = \frac{\text{Difference}}{\text{Original amount}} \times 100 \%$

➤ $\text{Profit} = \text{Selling price (SP)} - \text{Cost Price (CP)}$



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

➤ $\text{Profit \%} = \frac{\text{Profit}}{\text{CP}} \times 100$

➤ $\text{Loss \%} = \frac{\text{Loss}}{\text{CP}} \times 100$



➤ $\text{SP} = \left(\frac{100 + \text{Profit \%}}{100} \right) \times \text{CP} = \left(\frac{100 - \text{Loss \%}}{100} \right) \times \text{CP}$

➤ $\text{CP} = \left(\frac{100}{100 + \text{Profit \%}} \right) \times \text{SP} = \left(\frac{100}{100 - \text{Loss \%}} \right) \times \text{SP}$

➤ $\text{Discount} = \text{Marked price (MP)} - \text{Selling Price}$

➤ $\text{Discount \%} = \frac{\text{Discount}}{\text{MP}} \times 100$



Important Formulae



➤ Simple Interest =
$$\frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$$

➤ Amount = Principal + Interest

➤ Tax(in ₹) = Tax% × Bill Amount

➤ SP = Bill Amount + Tax

➤ Compound Interest



a. Compounded Annually : $A = P \left(1 + \frac{R}{100} \right)^T$

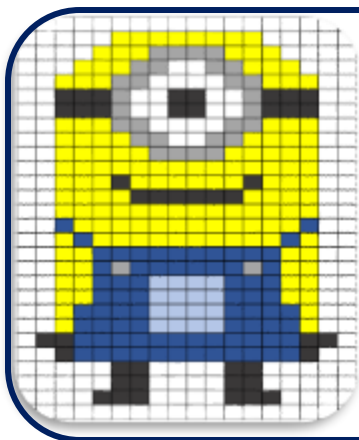
b. Compounded Half Yearly: Rate of Interest

becomes half, Time period becomes double

c. Compounded Quarterly: Rate Interest becomes

one fourth, Time period becomes 4 times





Answer Key 1

- 1:2, 3:7
- 46:163
- Percentage of legs = 4.29%,
Percentage of hands = 1.84%

Answer Key 2

- Increase Percent = 2.5%
- Decrease Percent = 1.09%

Answer Key 4

- d)14 kg
- d)11.1 %
- b)₹ 29500
- a)₹1500
- d)₹ 960
- b)5%
- c)16.67% gain
- d) ₹ 420
- b) ₹ 41250
- c) ₹ 4000

Answer Key 5

Plan A

Amount = ₹ 115000

Plan B

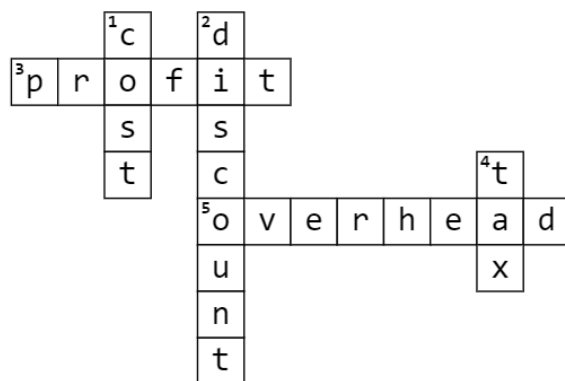
Amount = ₹ 133100

Plan C

Amount = ₹ 112616.20

Plan C is the most suitable plan.

Answer Key 3



- Discount
- 100
- 20 %
- ₹ 27500
- ₹ 36.91
- ₹ 1215
- 4%
- ₹ 23416.67

Answer Key 6

- ₹ 294.74
- 2.08% gain
- ₹ 70.31
- ₹ 5525
- ₹ 30240
- ₹ 3307.5
- ₹ 12500
- 2 years
- ₹ 17694.72
- 353440 sq.mile

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Message



Dear Readers,

Design is thinking made visible. We are grateful to CBSE for taking this great initiative of designing graphic novels at the school level and giving children a creative platform to curate their curiosity and learn best through the visual mode. The visual presentation of varied complex concepts woven in an interesting storyboard and displayed through vibrant and eye-catching graphics and illustrations make learning for the learners a fun-filled and joyous activity.

I wish to avail the opportunity to express my deepest sense of gratitude to Ms. Anita Karwal Secretary, Ministry of Education for giving us the platform to create this content for graphic novel. My deep gratitude to Mr. Sandeep Sethi, an eminent educationist associated with CBSE, for introducing us to this vital tool and being all supportive in providing the required training to my faculty members in crafting and designing this graphic novel addressing the varied 21st century skills. I feel equally indebted to Ms. Soumya Gulati, Deputy Director, Academic Development and Innovation, Blue Bells Group of Schools, for her constant support and always motivating us to be the tools of change in sync with the NEP.

I highly appreciate the efforts of my Mathematics team for curating and designing the graphic novel on the topic 'Comparing Quantities'. The novel is designed to motivate young learners, ignite their interest and to provide a better understanding of the concepts.

This vibrant presentation would not have become interesting and engaging without the cooperation of the Art and IT faculty of the school. I wish to express my deep gratitude to both the teams for working on the graphics and adding charm and charisma to the content. My sincere thanks to the CBSE for all their support and guidance in providing necessary handholding and giving shape to this new wave methodology by making it accessible to all regardless of the economic and geographic disparity. I sincerely hope that these graphic novels will help in concept building and strengthening the learning gaps of the students.

Enjoy Reading!

Alka Singh
Principal
Blue Bells Model School
Gurugram

Summary

Ansh and Anvi being inquisitive in nature love to explore and experience the concepts related to Mathematics. Their passion for learning mathematical concepts drives their family to visit various places to show the applications of commercial mathematics in their day-to-day living. This magical journey of profit/loss, tax, discount, simple and compound interest left an imprint on the minds of intrigued kids.



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