

SUMMARY SHEET

Learner Previous Knowledge

Calculate given percentages of quantities and solve problems related to it.

Understand what percent of increase or decrease means

Calculate the percentage of increase and decrease of a quantity.

Terms-Profit, Loss, Cost Price and Selling Price; Find profit or loss where $S.P. > C.P.$ or $S.P. < C.P.$; Calculate to find S.P (if C.P and profit/loss is given); Calculate to find C.P (if Spend Profit/loss is given); Profit % or loss %-Problem solving using the formula $P/C.P. \times 100\%$; Word Problems-Calculating profit, loss and their percentage excluding and including overhead expenses; Calculate C.P or S.P when profit or loss% is given.

Finding S.I , P, R, T using the formula $S.I = P \times R \times T/100$ and also finding the amount (when time is given in days, months and years); Solve word problems relating to S.I.

Target Knowledge for this Topic

Finding % of given quantity, evaluating one quantity as a percent of another;

Percentage of a number in measure of money, distance, weight and volume;

Taking the whole as 100% and finding the unknown by subtracting from 100%;

Solve problems on increase or decrease percent

Revise: What Profit, Loss, Cost Price and Selling Price;

Calculate to find S.P (if C.P and profit/loss is given);

Calculate to find C.P (if S.P and profit/loss is given);

Introducing the terms 'marked price', 'discount' and 'discount%'; Solve problems based on the formula: $\text{Discount} = M.P. - S.P.$ and $\text{Discount}\% = (\text{Discount}/M.P.) \times 100$; Find profit% or loss% when discount is given; Solving problems based on formula: $S.P. = \{1 - D/100\}$ of M.P, Overhead expenses and taxes etc.

Compound Interest-What is it? Application; Formula;

Difference between simple and compound interest

(compounded yearly up to 3 years or half yearly up to 3 steps only); Arriving at the formula for compound interest through patterns and using it for simple problems

Learning Goals**Taxonomy Level**

Class: 8	Subject: Mathematics	Topic: Comparing Quantities
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<i>More Complex Learning Goal- Students will be able to analyze errors and rectify them with logical explanations; differentiate between compound and simple interest</i>		Analyses
<i>Target Learning Goal- Students will be able to calculate percentages of increasing and decreasing of a quantity and solve problems involving percentages of a number in measure of money, distance, weight, discount and volume; solve problems based on profit and loss; S.P., C.P., discount, overhead expenses, marked price and taxes; to compute problems related to simple and compound interest</i>		Executing
<i>Simpler Learning Goal- Students will be able to provide real life situations or examples of different situations in which percentage involves; describe the meaning of the terms profit and loss, discount, marked price, overhead expenses, sales tax, C.P, S.P. with examples; to describe the meaning of compound and simple interest with examples</i>		Recalling
Period No.	Lesson Objectives	Teaching Learning Materials Required
1	- Recapitulate the meaning of percentages - Find % of given quantity, evaluating one quantity as a percent of another; - Word problems related to increase and decrease in percent.	Brainstorming session: Worksheet-1 (1 per student); Projector (1 per class) Recapitulation: Worksheet-2 (1 per student)
2 and 3 <i>Note: This lesson requires 2 days</i>	- Calculate percentage of a number in measure of money, distance, weight and volume; - Calculate the whole as 100% and finding the unknown by subtracting from 100%; - Solve different kinds of percentage real life problems.	- Projector (1 per class) Reading handout: Worksheet-3(1 per student)
4.	- Recapitulate, what Profit, Loss, Cost Price and Selling Price - Calculate to find S.P (if C.P and profit/loss is given) - Calculate to find C.P (if S.p and profit/loss is given) - Know marked price, overhead charges	Pre –assessment Worksheet: Worksheet-4 (1 per student); Projector (1 per class) Brainstorming: Worksheet-5 (1 per student)

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5 and 6 <i>Note: This lesson requires 2 days</i>	- Know Introducing the terms 'marked price', 'discount' and 'discount%'; - Compute problems related to discount and discount percent	<u>Real life situations:</u> Worksheet-6 (1 per student and 1 per teacher); Projector (1 per class)
7	Solve problems related to sales/vat taxes.	<u>Pre –assessment sheet:</u> Worksheet-7 (1 per student); Projector (1 per class); <u>Worksheet-8</u> (1 per student);
8.	- Recapitulate the information related to interest and simple interest - Find out the difference between simple and compound interest	<u>Research work:</u> Worksheet-9 (1 per student)
9	Solve problems related to simple interest	<u>Worksheet:</u> Worksheet-10 (1 per student); <u>Practice Exercise:</u> Worksheet-11 (1 per student)
10	- Strengthen the difference between simple and compound interest - Know about compound interest - Derive the formula to compute compound interest and use it in solving the real life problems.	<u>Worksheet:</u> Worksheet-12 (1 per student); <u>Worksheet-13</u> (1 per student); <u>Worksheet-14</u> (1 per student)
11 and 12 <i>Note: This plan requires 2 days</i>	- Use the derived formula of compound interest in solving the real life problems. - Build an understanding related to computing half yearly and quarterly compound interest	<u>Home assignment discussion:</u> Worksheet-14 (1 per student); <u>KWL chart:</u> Worksheet-15 (1 per student); projector (1 per class)

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Period 1

Lesson Objectives

At the end of this lesson students will be able to:

- Recapitulate the meaning of percentages
- Find % of given quantity, evaluating one quantity as a percent of another;
- Word problems related to increase and decrease in percent

Teaching Learning Materials required

- **Brainstorming session: Worksheet-1** (1 per student); Projector (1 per class)
- **Recapitulation: Worksheet-2** (1 per student)

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4 to 6

Lesson Beginning <u>Time:</u> 15 min <u>Purpose:</u> Activate prior knowledge Generate interest to the topic Develop conceptual understanding	<u>Pre class arrangement:</u> At the end of the previous day give students a home assignment to research on the given points: ○ What percentage means? ○ What is the history/origin of percentages? ○ Why there is a need to use percentage? ○ Examples and non-examples of percentages <u>Brainstorming session/Whole class</u> • Make groups of 4 to 6 students in each group. • Tell them to gather the data they have collected related to percentages in math notebook. • Then write the data clearly in the given Worksheet-1. • Give them 10 mins to segregate the data as per different categories. • Take up a discussion and randomly call students to share the data collected by them. • Ask the following questions: ○ What do they know about percentage? ○ How the word percentage came into existence? ○ Why there is a need to use percentage? ○ Share some examples and non-examples of percentages? • During the discussion they can add the additional or missing information in worksheet-1
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	<i>Note: This will be a 10 to 15mins task, where students are given the opportunity to share the collected data with the entire class and through discussion they will recapitulate the concept of percentages along with its history and origin. The students can discuss with their group members but work in their individual sheets. Make sure they will come up with real life situations where percentages are used.</i> • After the discussion collect the sheets for review and feedback. • Check the real life applications written by them and make a note of the errors made by them and good sample situations for tomorrow's discussion.
Lesson Middle <u>Time:</u> 10mins <u>Purpose:</u> Recapitulation	<u>Recapitulation/Pairs</u> • Inform students that they are going to recapitulate more about percentages, finding the quantity of the given percentages, finding the percentage of the given quantity and increase and decrease in percent etc. • Provide Worksheet-2 to each student and tell them to discuss and answer the questions in groups but record them individually. • They will get 10 min to attempt all the questions.
Lesson End <u>Time:</u> 15mins. <u>Purpose:</u> Develop the conceptual understanding Consolidate students learning	<u>Whole Class – Discussion</u> • Project Worksheet-2. • Ask a few students at random to share all the answers of the questions. • Build a class consensus on all the answers of the questions given in the sheet. <i>Note: Students may come up with incorrect answers. In this case, ask other students who may have the correct answers to explain and justify. It is important to build consensus on all answers – this will help eradicate any errors. Make sure students build the consensus on all the answers of the questions and recapitulate the knowledge of the concept of percentages and its conversion into decimals and fractions etc.</i>

Name: _____

Worksheet-1

Skill: Logical Reasoning

You collected the information related to percentages. Organize that information in the given graphic organizer.

History/Origin of percentages

Examples of percentages

Percentages

Non- Examples of percentages

Application of percentages in real life
situations

Name: _____

Worksheet-2**Skill: Problem Solving**

1. Fill in the blanks

a. Percent compares a number to a _____.

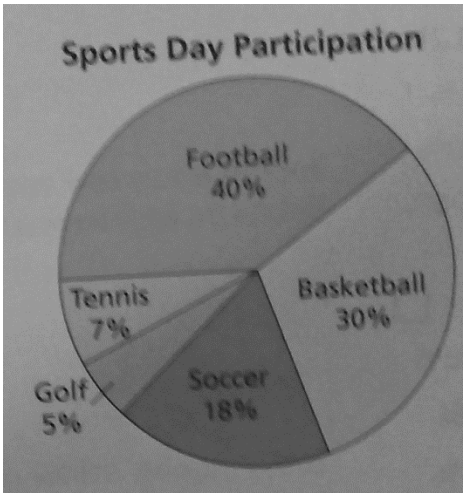
b. $10/100$ is equal to _____ %

c. 25 over 100 in decimal form is equal to _____

d. $\frac{1}{2}$ in percentage is equal to _____

2. Observe the pie chart and then answer the following questions:

Three thousand kids registered for sports day at the stadium. The circle graph shows the percent of kids who participated in each of the sport type.



a. How many more kids played football then tennis?

b. State True or False.

i. Is 0.07 representing tennis? _____

ii. 18 out of 100 kids play soccer. _____

c. Add the percent for kids playing golf and tennis.

d. Change the percent to decimal numbers. Explain the solution.

i. Football

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ii. Basketball

iii. Golf and Tennis

e. Initially 50% students participated in football but then it reduced to 40%. What is the percent of decrease in the number of students who participated in football? Write the steps used to find the answer.

f. Initially 20% students participated in basketball but at the end of the final stage it increases to 30%. What is the percent of increase in the number of students who participated in basketball? Write the steps used to find the answer.

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Period 2 and 3

Lesson Objectives

At the end of this lesson students will be able to:

- Calculate percentage of a number in measure of money, distance, weight and volume;
- Calculate the whole as 100% and finding the unknown by subtracting from 100%;
- Solve different kinds of percentage real life problems.

Teaching Learning Materials required

- **Reading handout: Worksheet-3** (1 per student)

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4 to 6

Lesson Beginning <u>Time:</u> 30 min <u>Purpose:</u> Activate prior knowledge Generate interest to the topic Introduce the topic Develop conceptual understanding	<u>Review of real life applications/Groups</u> • Shared with them that you have reviewed the Worksheet-1 yesterday and problems/real life situations created by them. • Discuss the good situations discovery of the process of their own with the entire class. • Also at the same time discuss and correct their errors and doubts along with the reason of rectification and justification; that why a particular problem can't be related to percentages. • Tell them to correct their problems on the basis of the discussion. <u>Categorization/whole class:</u> • Once they rectified the errors ask, what kind of real life problems they were able to pen down. • Write the relevant broader categories on the board shared by them and tell them to categories those problems as per those categories. • Also, share the reason behind rejecting a particular category or ask students why you need to accept and reject a particular category. <i>Note: Make sure they will come up with money, discount, weight, volume and distance categories</i> • Tell the groups to exchange the problems with another group.
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	• They need to solve the problems in order to verify the problems created by their fellow groups. • Give them 15 min to discuss and solve the problems. <u>Discussion/whole class</u> • Ask a few students from different groups at random to share the real life situations along with the solution and build consensus on all the answers. • Ask the following questions from the representative groups/students: ○ How did you arrive at the answer? Give justification. <i>Note: students may come up with different or incorrect answers. In this case, ask other students who may have the correct answers to explain and justify. It is important to build consensus on all shared situations and answers – this will help eradicate any errors and familiarizing with the process of solving different kind of problems. The intent here is to provide an exposure of different kinds of real life problems/situations related to percentages and bring into the focus on the process involved in solving these problems.</i>
Lesson Middle <u>Time:</u> 40mins <u>Purpose:</u> Activate prior knowledge generate interest to the topic Introduce the topic Develop conceptual understanding	<u>Reading handout/Groups</u> • Provide a reading handout Worksheet-3 to each student of the group. • Tell them they will have to read the information given in the handout and then validate the method and steps used by them in order to solve different kinds of percentages problems. • Also attempt the practice questions after reading the handout. • Give them 15 to 20 min to complete the task. <u>Whole Class – Discussion</u> • Project Worksheet-3. • Ask a few students at random to share the answers of all the questions. • Ask the following questions: ○ The question shared by you belongs to which kind of percentage situation? ○ How did you arrive at the answer? <i>Note: Students may come up with incorrect answers. In this case, ask other students who may have the correct answers to explain and justify. It is important to build consensus on all answers – this will help eradicate any errors. Make sure that they</i>

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	<i>will understand the process of computation involved in different kind of percentage problems.</i>
Lesson End <u>Time:</u> 10 mins <u>Purpose:</u> Finish up	<u>Home assignment</u> Tell students to practice questions on Pg 119-Exercise 8.1 of NCERT Textbook.

Name: _____

Worksheet-3

Skill: Problem Solving

You know, percentages mean comparing two quantities.

Situations related to comparison of 2 quantities:

Situation: A basket has two types of fruits, say, 20 apples and 5 oranges. Then, the percent of the number of oranges to the number of apples is

There are 5 oranges out of 25 fruits.

So percentage of oranges is

$$\frac{5}{25} \times \frac{4}{4} = \frac{20}{100} = 20\%$$

[Denominator made 100].

By unitary method:

Out of 25 fruits, number of oranges are 5.

So out of 100 fruits, number of oranges

$$= \frac{5}{25} \times 100 = 20.$$

Since contains only apples and oranges,

So, percentage of apples + percentage of oranges = 100

or percentage of apples + 20 = 100

or percentage of apples = 100 – 20 = 80

Thus the basket has 20% oranges and 80% apples.

Situations related to distance

Situation: The picnic site is 55 km from the school and the transport company is charging at the rate of rupees 12 per km. The total cost of refreshments will be rupees 4280. If their first stop is at a place 22 km from the school, what per cent of the total distance of 55 km is this? What per cent of the distance is left to be covered?

To find the percentage of distance:

Ashima used this method:

$$\frac{22}{55} = \frac{22}{55} \times \frac{100}{100} = 40\%$$

[She is multiplying
the ratio by $\frac{100}{100} = 1$
and converting to
percentage.]

OR

John used the unitary method:

Out of 55 km, 22 km are travelled.

Out of 1 km, $\frac{22}{55}$ km are travelled.

Out of 100 km, $\frac{22}{55} \times 100$ km are travelled.

That is 40% of the total distance is travelled.

Both came out with the same answer that the distance from the school of the place where they stopped at was 40% of the total distance they had to travel.

Therefore, the percent distance left to be travelled = $100\% - 40\% = 60\%$

Situations related to discounts

Discount is a reduction given on the Marked Price (MP) of the article.

This is generally given to attract customers to buy goods or to promote sales of the goods. You can find the discount by subtracting its sale price from its marked price.

So, Discount = Marked price – Sale price

An item marked at ₹ 840 is sold for ₹ 714. What is the discount and discount %?

Solution: Discount = Marked Price – Sale Price
= ₹ 840 – ₹ 714
= ₹ 126



Since discount is on marked price, we will have to use marked price as the base.



On marked price of ₹840, the discount is ₹126. On MP of ₹100, how much will the discount be?

$$\text{Discount} = \frac{126}{840} \times 100 = 15\%$$

You can also find discount when discount % is given.



Your bill in a shop is ₹577.80 and the shopkeeper gives a discount of 15%. How would you estimate the amount to be paid?

(i) Round off the bill to the nearest tens of ₹577.80, i.e., to ₹580.

(ii) Find 10% of this, i.e., $\text{₹}\frac{10}{100} \times 580 = \text{₹}58$

(iii) Take half of this, i.e., $\frac{1}{2} \times 58 = \text{₹}29$

(iv) Add the amounts in (ii) and (iii) to get ₹87. You could therefore reduce your bill amount by ₹87 or by about ₹85, which will be ₹495 approximately.

Practice questions:

1. Try estimating 20% of the same bill amount that is ₹577.80.

2. Try finding 15% of ₹375.

2. A shop gives 20% discount. What would the sale price of each of these be?

(a) A dress marked at ₹120	(b) A pair of shoes marked at ₹750	(c) A bag marked at ₹250
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3. An almirah is sold at ₹5,225 after allowing a discount of 5%. Find its marked price.

4. If Chameli had ₹600 left after spending 75% of her money, how much did she have in the beginning?

5. 72% of 25 students are good in cricket. How many are not good in cricket?

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Period 4

Lesson Objectives

At the end of this lesson students will be able to:

- Recapitulate, what Profit, Loss, Cost Price and Selling Price
- Calculate to find S.P (if C.P and profit/loss is given)
- Calculate to find C.P (if S.P and profit/loss is given)
- Know marked price, overhead charges

Teaching Learning Materials required

- **Pre –assessment Worksheet: Worksheet-4** (1 per student); Projector (1 Per class)
- **Brainstorming: Worksheet-5** (1 per student)

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Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4 to 6

Lesson Beginning <u>Time:</u> 15 min <u>Purpose:</u> Activate prior knowledge Recapitulation	<u>Pre- assessment sheet/Whole class</u> • Inform students, “in today’s class we will recall the definitions of profit and loss and how can we calculate it. • Distribute a pre-assessment Worksheet-4 to each student and ask them to attempt the questions • Give them 15 minutes to discuss and answer the questions. <i>Note: The students can discuss with their group members but work in their individual sheets. The intent here is to recapitulate the knowledge of profit and loss which they have built in grade 7.</i> <u>Whole Class – Discussion</u> • Project Worksheet-4. • Ask a few students at random to share what is C.P., S.P., and profit and loss? • Build a class consensus on all the answers of the questions given in the sheet. <i>Note: Students may come up with incorrect answers. In this case, ask other students who may have the correct answers to explain and justify. It is important to build consensus on all answers – this will help eradicate any errors. Make sure through discussion they need to come up with the fact that profit and loss is over the original quantity.</i>
Lesson Middle <u>Time:</u> 20 min <u>Purpose:</u> Introduce new topic Develop the conceptual understanding Consolidate students learning	<u>Brainstorming/Whole class</u> • Pose the question to the class. Students, placed in groups, discuss possible answers. ○ A brand of sneakers costs Rs. 290 to manufacture in Narela,. The shoes are then shipped to shoe stores across the country India. When you see them on the shelves, the price is Rs. 490. How do you think the price you pay for the sneakers is determined? Use percent to describe the marked up price. Explain your reasoning. • Asks a few students to share out the answers. • Build a class consensus on the given reasoning: ○ <i>The store makes up a new price so they can make money.</i>

	○ The store has to buy the sneakers and pay for any transportation costs to get the sneakers to the store. ○ The store marks up the price to earn a profit because they had to buy the shoes from the company. ○ Marked up price is the amount of increase in a price from the original price. ● Close the discussion by explaining how the price of an item sold in a store is determined. For example, in order for the manufacturer to make a profit, the store has to pay for the cost to make the item. Then, a store purchases the item at a <i>cost price</i> from the manufacturer. The store then increases the price of the item by a percent called the <i>markup rate</i> before it is sold to the store's customers. Stores do this to earn a <i>profit</i>. ● Provide Worksheet-5 to each student of the group and tell them to read the situation and attempt the questions related to the given situation. ● Then ask random students to share the answers of the questions and what they understood more about marked price, overhead expenses, original price, gain percent, loss percent etc.
Lesson End <u>Time:</u> 5 min <u>Purpose:</u> Finish up	<u>Home assignment</u> ● Also, they will find 2 situations related to discount, sales percent and bring it next day for discussion. ● Tell the students to practice questions 1 to 5 on Pg 125-Exercise 8.2 of NCERT Textbook.

Name: _____

Worksheet-4**Skill: Procedural fluency**

Reena buys a novel for ₹300 from a shopkeeper. She then sells it to Anna, her friend, for ₹350. What does Reena gain from this transaction?

Using the above story problem try to write the definitions for the given terms.

- Cost price:

- Selling price

- Profit

- Loss

2. Shreya buys a wrist watch for ₹400 and sells it to Meena for ₹480. Meena sells it to Neena for ₹432. Find

- Shreya's profit
- Meena's loss

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iii. Write the steps you used to find the profit and loss.

iv. Recall and write the formulae, which you can use to find profit, loss, profit % and loss %.

v. What can you generalize using the above questions related to profit and loss?

Name: _____

Worksheet-5

Skill: Problem Solving

Topic- Profit and Loss (Marked price)

For the school fair (mela) Reena is going to put a stall of lucky dips. She will charge ₹ 10 for one lucky dip which she bought in ₹5

Her friend said that she will make a 100% profit if she sells them in ₹10 after buying it in ₹5

Reena said, no because she will spend ₹3 on paper to wrap the gift and tape. So her expenditure is ₹8. This gives her a profit of ₹ 2, which is, $\frac{2}{8} \times 100 =$ _____

What is the original price of the lucky dip? _____

At what cost Reena think to sell the lucky dip? _____ is this is her marked price? Why or why not?

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How much percent of profit is she getting after her total expenditure? Justify?

Do you know?

Before selling the lucky dip she adds the expense (₹3) of a gift wrap after which the lucky dip cost is ₹8. This additional expense is known as *overhead charges*. These expenses have to be included in the cost price. Like amount spent on repairs, labor charges, transportation etc. after this the seller decides the selling price such that he/she can make some amount of profit.



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Period 5 and 6

Lesson Objectives

At the end of this lesson students will be able to:

- More about the terms 'marked price', 'discount' and 'discount%';
- Compute problems related to discount and discount percent

Teaching Learning Materials required

- **Real life situations: Worksheet-6** (1 per student and 1 per teacher); Projector (1 per class)

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4 to 6

Lesson Beginning	<u>Real life situations/groups</u>
<u>Time</u> : 25 mins	
<u>Purpose</u> :	
Activate prior knowledge	• Ask, what can they recall about marked price, profit %, loss percent etc. • Quickly recapitulate the terminologies related to profit, profit percent, loss percent etc.
Generate interest to the topic	• Tell them today they are going to know about discount related problems of profit and loss. • Ask the following questions from each group and let them work in groups to discuss the answer: ○ What do they mean by discount? ○ Where do they see the usage of this word discount in real life? ○ What happen in such kind of situations?
Introduce the topic	• Randomly ask students to share their views or answers of the questions asked above.
Develop the conceptual understanding	<i>Note: Students may come up with incorrect answers. In this case, ask other students who may have the correct answers to explain and justify. It is important to build consensus on all answers – this will help eradicate any errors. Make sure they come up with an understanding of the following things:</i> ○ A discount is a reduction in the marked (or list) price of an article. “20% discount” means a reduction of 20% in the marked price of an article. For example, if the marked price of an article is ₹100, it is sold for ₹80, i.e. ₹20 less than the marked price.

- **Marked Price (or List price):** The marked price (M.P.) of an article is the price at which the article is listed for sale. Since this price is written (marked) on the article, so it is called the marked price.
- **Discount:** The discount is the reduction from the marked price of the article.
- **Net selling price (S.P.):** In case of discount selling, the price of the article obtained by subtracting discount from the marked price is called the Net Selling price or Selling price (S.P.)

- Tell them to understand more about this using the examples and questions.
- Provide **Worksheet-6** to each student of the group.
- Give them 5 to 7 mins to attempt all the questions.

Whole Class – Discussion

- Project Worksheet-6.
- Ask a few students at random to share the answers of all the questions.
- Ask the following questions from the representative group or student:
 - How did you arrive at the answer?
 - Which strategy did you use?
 - Justify your answers or process of finding the answers.
- Build a class consensus on all the answers of the questions given in the sheet.

Note: Students may come up with incorrect answers. In this case, ask other students who may have the correct answers to explain and justify. It is important to build consensus on all answers – this will help eradicate any errors. Make sure that they came up with the term irreducible factors and can understand the process of solving discount related problems of profit and loss percent. Make them understand. . The formula used in the worksheet may vary with the formula used by the students or by you.

Lesson Middle

Time: 15 mins

Purpose:

Develop conceptual understanding

Gathering situations/Groups

- Now inform students to collate all the situations they have collected from home, on a given A4 sheet.
- Exchange the situations with the other group members to solve and verify those situations.

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	- In order to verify the problems students' needs to take care of the following parameters: - The situation involves discount, discount percent, S.P., C.P. etc. - They will be able to use appropriate formulae related to profit and loss in order to find the solution - They will be able to find the answer. - Share the parameters and give them time to solve the problems.
Lesson End <u>Time:</u> 40 mins. <u>Purpose:</u> Develop conceptual understanding Consolidate students learning	<u>Whole Class – Discussion</u> - Randomly call groups to share the situations they got and the process of solving those problems. - Ask the following questions from the representative groups: - Which situation you got? - What made you think that the situation is related to discount, percent, profit and loss etc? - How did you arrive at an answer? - Is the situation correct or not? - If the situation has some flaw, then how can the situation it be changed to a validated one? - Ask a few students at random to share the answers of all the questions. - Build a class consensus on all the situations and answers. <i>Note: Students may come up with incorrect situations and answers. In this case, ask other students who may have the correct answers to explain and justify. It is important to build consensus on all answers – this will help eradicate any errors. The intent here is to give them practice to solve discount related real life problems based on the formulas $\text{Discount} = M.P - S.P$ and $\text{Discount}\% = (\text{Discount}/M.P) \times 100$ and finding profit or loss% when discount is given.</i>

Name: _____

Worksheet-6

Skill: Problem Solving

- A 300 rupee t-shirt is discounted by 30% and then discounted an additional 10% for shoppers who arrive before 5:00 a.m.
 - Find the sales price of the bicycle.

b. In all, by how much has the bicycle been discounted? Explain.

c. After both discounts were taken, what was the total percent discount?

d. Instead of purchasing the T-shirt for ₹ 300, how much would you save if you bought it before 5:00 a.m.?

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Period 7

Lesson Objectives

At the end of this lesson students will be able to:

- Solve problems related to sales/vat taxes.

Teaching Learning Materials required

- **Pre –assessment Worksheet: Worksheet-7** (1 per student); Projector (1 per class); **Worksheet-8** (1 per student);

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4 to 6

Lesson Beginning <u>Time:</u> 15 min <u>Purpose:</u> Activate prior knowledge Generate interest to the topic Introduce the topic	<u>Worksheet/groups</u> • Provide Worksheet-7 as a part of the beginning exercise of this lesson plan. • Tell them to attempt the questions and write their generalization related to sales tax problems. • Give them 5 to 7 minutes to complete the task. <u>Discussion/Groups</u> • Project Worksheet-7. • Held a class discussion and discuss the answers of all the questions. • Ask the following questions: ○ What do you mean by sales tax? ○ How did you find the sales tax percent? ○ Why do you think we need to give sales tax? • Build a class consensus on all the answers and on the formula of finding out sales tax percent amount. <i>Note: It may happen that students come up with different or incorrect observations and answers. In this case, ask other students to explain and justify. It is important to build consensus on all the answers of the questions– this will help eradicate any errors. The intent here is to make them to know and understand the process of finding sales tax percent, what sales tax it and why do we need to pay sales tax.</i>
Lesson Middle	<u>Worksheet/Groups</u>

<u>Time:</u> 20 mins <u>Purpose:</u> Introduce the topic Develop the conceptual understanding	• Provide Worksheet-8 to give more exposure in real life problems related to sales tax in which discount involves. • Tell them to attempt the questions. • Give them 10 minutes to complete the task. <u>Discussion/Groups</u> • Project Worksheet-8. • Held a class discussion and discuss the answers of all the questions. • Ask the following questions from the representative groups/students: ○ How did you arrive at an answer? ○ How commutative property of multiplication is related with this problem of sales tax? Explain • Build a class consensus that both final prices are the same, it does not matter which is applied first. This is because multiplication is commutative. The discount rate and sales tax rate are both being applied to the whole. <i>Note: It may happen that students come up with different or incorrect observations. In this case, ask other students who may have the correct analysis to explain and justify. It is important to build consensus on all the answers of the questions– this will help eradicate any errors</i>
Lesson End <u>Time:</u> 5 min <u>Purpose:</u> Finish up	Home Assignment: • Tell the students to practice questions 6 to 10 on Pg 125-Exercise 8.2 of NCERT Textbook

Name: _____

Worksheet-7**Skill: Problem Solving****Topic- Sales tax****Observe the given cash memos and answer the given questions.**

Class: 8**Subject: Mathematics****Topic: Comparing
Quantities****Cash memo 1****BOULEVARD**

ONE MISSION STREET
SAN FRANCISCO, CA 94105
(415) 543-8084
DINING ROOM

1019 KEN

Tbl 64/1 Chk 9458 Gst 2
Feb15'06 07:20PM

1 HENDRIKS	8.00
1 BOURBON MANHATN	8.75
1 D SOUP	13.75
1 D ABALONE	19.50
1 D LOBSTER LINGUI	18.75
1 D SHORTRIB	17.50
1 D SWEETBREADS	17.25
1 D LAMB	32.00
1 D PORK	31.00
1 1/2 GL-3 SAINTS PN	5.50
1 1/2 GL SAUV BLANC	4.25
1 1/2 GL-BAROLO	9.75
1 1/2 G- UNTI SYRAH	5.50
1 POTRERO	10.50
1 G-CASTELNAU	9.00
1 D BANANAS FOSTER	9.50
1 D TRIO	9.75

SUBTOTAL 230.25
Tax 19.57
Total **249.32**

Cash memo 2

0115b Table 210 #Party 1
SORIN B SvrCk: 3 12:49p 04/01/13

1 NEW CASTLE	8.00
1 ICED TEA	5.00
1 SEAFOOD COMBO	26.00
1 LOBSTER SALAD	21.00
1 FILET MIGNON	47.00
1 BANANA PIE	12.00

Sub Total: 119.00

TAX : 10.27

04/01 1:53p **TOTAL: 129.27**

Thank You !

1. What is the sub total bill in both the memos?

2. How much did the customers paid actually? Explain.

Class: 8	Subject: Mathematics	Topic: Comparing Quantities
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3. What percent of tax the customers paid in both the cases? Explain and Justify your solution.

4. What can you generalize with this activity?

Name: _____

Worksheet-8

Skill: Problem Solving

Topic- Sales tax

You knew that ST means Sales Tax, which we pay when we buy items. This sales tax is charged by the government on the sale of an item. It is collected by the shopkeeper from the customer and given to the government. This is, therefore, always on the selling price of an item and is added to

Class: 8	Subject: Mathematics	Topic: Comparing Quantities
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the value of the bill. These days however, the prices include the tax known as Value Added Tax (VAT).

Let's try to solve the situation where discount is given including sales tax.

1. A TV that normally sells for ₹20000 is on sale for ₹16,000. The sales tax is 7.5%.
 - i. What is the *whole* quantity in this problem?

- ii. What percent of the original price of the car is the final price?

- iii. Find the discount rate.

- iv. By law, sales tax has to be applied to the discount price. However, would it be better for the consumer if the 7.5% sales tax was calculated before the 20% discount was applied? Why or why not?

Class: 8	Subject: Mathematics	Topic: Comparing Quantities
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- v. Write an equation applying the commutative property to support your answer to part (iv).

Period 8

Lesson Objectives

At the end of this lesson students will be able to:

- Recapitulate the information related to interest and simple interest
- Find out the difference between simple and compound interest

Teaching Learning Materials required

- **Research work: Worksheet-9** (1 per student)

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4 to 6

Lesson Beginning <u>Time</u> : 20 min <u>Purpose</u> :	<u>Pre class arrangement</u>: • At the end of the previous day's plan give students a research work to find out when you put money in the bank what happens? <u>Recapitulation/Whole class</u>
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Activate prior knowledge Generate interest to the topic Introduce the topic	• Begin class with a discussion of what happen with the money when you put it in the bank. • Pose the question first and have students share their ideas or information, which they have collected at home. <i>Note: Make sure students will come up with the following explanation: bank pays us interest for the honor of looking after our money.</i> <u>Research work/Groups</u> • Tell students to research on the following points: ○ About different kinds of interest, which bank provides to take care of the money. ○ How bank process these interests? • Provide Worksheet-9 to record their findings in a structured way. • Give them time to complete the research work. <i>Note: Though the students will get the separate recording sheets to collate the data but they are going to research and work in groups</i>
Lesson Middle <u>Time:</u> 20 min <u>Purpose:</u> Develop the conceptual understanding Consolidate students learning	<u>Whole Class – Discussion</u> • Project Worksheet-9. • Ask the following questions from the representative student or groups: ○ What kind of interest bank provides? ○ What information they were able to collect related to simple interest and compound interest? ○ What is the difference between simple and compound interest? ○ How bank process these interests? ○ Why it is necessary for the banks to give interest on our money? • Build a class consensus on all the answers. <i>Note: Students may collect and share incorrect answers. In this case, ask other students who may have the correct answers to explain and justify. It is important to build consensus on all answers – this will help eradicate any errors. Through discussion make sure to come up with an understanding of Simple interest, compound interest, difference between the two, how and why bank process these interest and why there is a need to give interest.</i>

Lesson End <u>Time:</u> <u>Purpose:</u> NA	
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Name: _____

Worksheet-9

Skill: Logical Reasoning

Topic- Simple interest and Compound interest

Types of interest



Class: 8	Subject: Mathematics	Topic: Comparing Quantities
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i. How bank process these interests?

ii. Why it is necessary or important for the banks to give interest on our money?

Class: 8	Subject: Mathematics	Topic: Comparing Quantities
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Period 9

Lesson Objectives

At the end of this lesson students will be able to:

- Solve problems related to simple interest

Teaching Learning Materials required

- **Worksheet-10** (1 per student);
- **Practice Exercise: Worksheet-11** (1 per student & 1 for teacher)

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4 to 6

Lesson Beginning <u>Time:</u> 15 min <u>Purpose:</u> Activate prior knowledge	<u>Worksheet/Groups</u> • Inform today we are going to solve problems related to simple interest • Provide Worksheet-10 to each student of the group. • Use the basic situations given in the sheet to make sure that students recall the concept of simple interest and its computation.
Lesson Middle <u>Time:</u> 20 min <u>Purpose:</u> Develop the conceptual understanding Consolidate students learning	<u>Whole Class - Discussion</u> • Project Worksheet-10 • Ask a few students at random to share the answers of the given questions. • Ask the following questions: ○ How did you arrive at the answer? ○ What can you conclude after solving the situations related to simple interest? • Build a class consensus on all the answers and make sure that students were able to recall and use the formula to solve word problems related to simple interest. <i>Note: Students may come up with incorrect answers. In this case, ask other students who may have the correct answers to explain and justify. It is important to build consensus on all answers – this will help eradicate any errors. Make sure to encourage the students to explain the steps used to solve each questions.</i>

Class: 8	Subject: Mathematics	Topic: Comparing Quantities
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Lesson End <u>Time:</u> 5 min <u>Purpose:</u> Finish up	<u>Home Assignment:</u> Distribute Worksheet-11 to each student to complete it at home.
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Name: _____

Worksheet-10

Skill: Problem Solving

Banks originally computed simple interest, and that is the type of interest that we will study in this example. Simple interest is calculated at the end of each year on the original amount either borrowed or invested (the principal).

Situation 1: Kiran has been working part time since 10th grade. She has saved ₹1, and wants to open an account at the bank so that she will earn interest on her savings. Simple Bank pays simple interest at a rate of **10%**. How much money will Kiran have after **1** year? After **2** years, if she does not add money to her account? After **5** years?

1.b. How did you arrive at an answer? Give the formula and explain the steps.

Situation 2: A sum of ₹10,000 is borrowed at a rate of interest 15% per annum for 2 years. Find the simple interest on this sum and the amount to be paid at the end of 2 years. Explain the steps.

2. b. How did you arrive at an answer? Give the formula and explain the steps.

Situation 3: Find interest and amount to be paid on ₹15000 at 5% per annum after 2 years.

3. b. How did you arrive at an answer? Give the formula and explain the steps.

4. Rahul needs ₹.200 to start a snow cone stand for this hot summer. He borrows money from a bank that charges 4% simple interest per year.

a. How much will he owe if he waits 1 year to pay back the loan? If he wait for 2 years? 3 years? 4 years? 5 years?

b. Write a formula for the amount he will owe after t years.

5. Can you see a sequence developing from the answer to these questions? What do you notice?

Class: 8	Subject: Mathematics	Topic: Comparing Quantities
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Name: _____

Worksheet-11

Skill: Problem Solving

Topic- Simple Interest

You know that when a person has to borrow some money as a loan from his friends, relatives, bank etc. He promises to return it after a specified time period along with some extra money for using the money of the lender. The money borrowed is called the **Principal**, usually denoted by P, and the extra money paid is called the **Interest**, usually denoted by I.

The total money paid back, that is, the sum of Principal and the Interest is called the **Amount**, and is usually denoted by A. Thus, $A = P + I$

The interest is mostly expressed as a rate percent per year (per annum). Interest depends on, how much money (P) has been borrowed and the duration of time (T) for which it is used. Interest is calculated according to a mutually agreed rate percent, per annum (R). [i.e. $R = r \% = \frac{r}{100}$]

Thus, Interest = (Principal) $\times$ (Rate % per annum) $\times$ time

Therefore = $P \times R \times T$

Interest calculated as above, is called simple interest. Let us take some examples, involving simple interest.

1. Find the simple interest in each of the following cases

	P	R	T
(a)	₹ 8000	5%	2 yrs
(b)	₹ 20,000	15%	$1\frac{1}{2}$ yrs

2. Find at what rate of simple interest per annum will ₹5000 amount to ₹6050 in 3 years.

3. A sum amounts to ₹4875 at $12\frac{1}{2}\%$ simple interest per annum after 4 years. Find the sum.

4. Vijay deposited ₹2350 in a savings account that pays 4.5% interest. If Vijay keeps the money in the account for 30 months, how much interest will he earn?

1. A certain sum of money at simple interest amounts to ₹1300 in 4 years and to ₹1525 in 7 years. Find the sum and rate percent.

Class: 8	Subject: Mathematics	Topic: Comparing Quantities
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Period 10

Lesson Objectives

At the end of this lesson students will be able to:

- Strengthen the difference between simple and compound interest
- Know about compound interest
- Derive the formula to compute compound interest and use it in solving the real life problems.

Teaching Learning Materials required

- **Worksheet-12, Worksheet-13, Worksheet-14** (1 per student);

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4 to 6

Lesson Beginning <u>Time:</u> 15 min <u>Purpose:</u> Activate prior knowledge Generate interest to the topic Introduce the topic	<u>Research work/groups</u> • Assemble all the students in the library and make them sit in groups. • Provide Worksheet-12 as a part of the beginning exercise of this lesson plan. • Tell them attempt the questions and find out the information related to compound interest like what is it? When and how it is used by the banks, derive the formula of compound interest, what are the situations in which compound interest is used etc. • Give them 10 to 15 minutes of time to complete the task <i>Note: Though students will be recording responses individually, they will be working in groups to research and find information</i> <u>Whole Class – Discussion</u> • Project Worksheet-12 • Ask a few students at random to share the answers of all the questions. • Ask the following questions: ○ What do they get to know more about compound interest? ○ How it is different from simple interest? ○ Why there is a need to use compound interest when there is an availability of simple interest. ○ In what situations compound interest needs to be calculated? • Build a class consensus on all the answers.
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Note: Students may come up with incorrect answers. In this case, ask other students who may have the correct answers to explain and justify. It is important to build consensus on all answers – this will help eradicate any errors. Make sure that they understand compound interest and its importance. Also, through discussion the formula to compute compound interest needs to be derived along with the situations in which people can use compound interest.

Lesson MiddleTime: 15 minPurpose:

Introduce the topic

Develop the
conceptual
understandingConsolidate
students learning**Worksheet/Groups**

- Distribute a **Worksheet-13** to each student of the group.
- Instruct them to read the information and derive the formula of compound interest.
- Give them 15 minutes to read the text and derive the formula.

Note: The intent here is to provide opportunity to students to know more about compound interest, with this information they can check the validity of the information which they knew or built in the previous lesson plans. Also, they can derive the formula to compute compound interest. Make sure they come up with the desired results:

- Suppose P_1 is the sum on which interest is compounded annually at a rate of $R\%$ per annum.
- Let $P_1 = ₹ 5000$ and $R = 5\%$ per annum. Then by the steps mentioned in Example 2 we can compute the following:.

$$1. \quad SI_1 = ₹ \frac{5000 \times 5 \times 1}{100}$$

$$\text{or} \quad SI_1 = ₹ \frac{P_1 \times R \times 1}{100}$$

$$\text{so, } A_1 = ₹ 5000 + \frac{5000 \times 5 \times 1}{100}$$

$$\text{or} \quad A_1 = P_1 + SI_1 = P_1 + \frac{P_1 R}{100}$$

$$= ₹ 5000 \left(1 + \frac{5}{100} \right) = P_2$$

$$= P_1 \left(1 + \frac{R}{100} \right) = P_2$$

$$SI_2 = ₹ 5000 \left(1 + \frac{5}{100} \right) \times \frac{5 \times 1}{100}$$

$$\text{or} \quad SI_2 = \frac{P_2 \times R \times 1}{100}$$

$$= ₹ \frac{5000 \times 5}{100} \left(1 + \frac{5}{100} \right)$$

$$= P_1 \left(1 + \frac{R}{100} \right) \times \frac{R}{100}$$

$$= \frac{P_1 R}{100} \left(1 + \frac{R}{100} \right)$$

$$\begin{aligned}
 A_2 &= ₹ 5000 \left(1 + \frac{5}{100}\right) + ₹ \frac{5000 \times 5}{100} \left(1 + \frac{5}{100}\right) & A_2 &= P_2 + SI_2 \\
 &= ₹ 5000 \left(1 + \frac{5}{100}\right) \left(1 + \frac{5}{100}\right) & &= P_1 \left(1 + \frac{R}{100}\right) + P_1 \frac{R}{100} \left(1 + \frac{R}{100}\right) \\
 &= ₹ 5000 \left(1 + \frac{5}{100}\right)^2 = P_3 & &= P_1 \left(1 + \frac{R}{100}\right) \left(1 + \frac{R}{100}\right) \\
 & & &= P_1 \left(1 + \frac{R}{100}\right)^2 = P_3
 \end{aligned}$$

Proceeding in this way the amount at the end of n years will be

$$A_n = P_1 \left(1 + \frac{R}{100}\right)^n$$

Or, we can say $A = P \left(1 + \frac{R}{100}\right)^n$

- Using the above calculations we get only the formula for the amount to be paid at the end of n years, and not the formula for compound interest.
- If we know $CI = A - P$, so we can easily find the compound interest too.

Lesson End

Time: 10 min

Purpose: Finish up

Application/Groups

- Provide **Worksheet-14** and tell them to apply the derived formula in order to solve question 1.
- Give them 5 min to discuss and solve the problems in pairs.
- Then at random ask students to share the answer and steps used by them in order to solve the problem.

Note: Students may come up with different or incorrect answers. In this case, ask other students who may have the correct answers to explain and justify. It is important to build consensus on the answer by using the derived formula of compound interest– this will help eradicate any errors.

- Tell them to solve other questions of the same worksheet at home.

Name: _____

Worksheet-12

Skill: Logical Reasoning

Topic- Simple and Compound interest

1. What do you mean by simple interest?

Class: 8	Subject: Mathematics	Topic: Comparing Quantities
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2. How can it be calculated? Write the formula.

3. What do you call when the interest is calculated on the amount of the previous year?

4. Find out how do you calculate compound interest? Why do we need to find out compound interest?

5. Give 2 examples or situations where there is a need to compute compound interest?

Name: _____

Worksheet-13

Skill: Problem Solving

You got to know the following facts related to compound interest.

Compound interest: Interest that is earned

In the previous section, you have studied about simple interest. When the interest is calculated on the Principal for the entire period of loan, the interest is called simple interest and is given by $I = P \times R \times T$. But if this interest is due (not paid) after the decided time period, then it becomes a part of the principal and so is added to the principal for the next time period, and the interest is

calculated for the next time period on this new principal. Interest calculated, this way is called **compound interest**. The time period after which the interest is added to the principal for the next time period is called the **Conversion Period**. The conversion period may be one year, six months or three months and the interest is said to compounded, annually, semi-annually or quarterly, respectively. Let us take an example:

Example 1: Find the compound interest on a sum of Rs. 2000, for two years when the interest is compounded annually at 10% per annum.

Solution: Here $P = ₹2000$ and $R = 10\%$

Therefore interest for the first conversion time period (i.e. first year) = $₹2000 \times \frac{10}{100} \times 1 = ₹200$

Therefore Principal for the second year (or 2nd conversion period) = $₹(2000 + 200) = ₹2200$

Therefore Interest for the 2nd time period = $₹2200 \times \frac{10}{100} \times 1 = ₹220$

Therefore Amount payable at the end of two years = $₹(2200 + 220) = ₹2420$

Therefore Total interest paid at the end of two years = $₹(2420 - 2000) = ₹420$
 or $[₹(200 + 220) = ₹420]$

Hence Compound interest = ₹420

Thus, for calculating the compound interest, the interest due after every conversion period is added to the principal and then interest is calculated for the next period.

Let's see another example:

Example 2: A sum of ₹20,000 is borrowed by Harish for 2 years at an interest of 8% compounded annually. Find the Compound Interest (C.I.) and the amount he has to pay at the end of 2 years.

Solution: This means that they should find the interest year by year. We can use the following steps:

Step 1: Find the Simple Interest (S.I.) for one year.

Let the principal for the first year be P_1 . Here, $P_1 = ₹20,000$

$SI_1 = SI \text{ at } 8\% \text{ p.a. for 1st year} = ₹\frac{20,000 \times 8}{100} = ₹1600$

Step 2: Then find the amount which will be paid or received. This becomes principal for the next year.

Amount at the end of 1st year = $P_1 + SI_1 = ₹20000 + ₹1600 = ₹21600 = P_2$ (Principal for 2nd year)

Step 3: Again find the interest on this sum for another year.

$SI_2 = SI \text{ at } 8\% \text{ p.a. for 2nd year} = ₹\frac{21600 \times 8}{100} = ₹1728$

Step 4: Find the amount which has to be paid or received at the end of second year.

Amount at the end of 2nd year = $P_2 + SI_2 = ₹21600 + ₹1728 = ₹23328$

Total interest given = $₹1600 + ₹1728 = ₹3328$

Find out whether the amount would be different for simple interest.

Hint: Find the interest for two years.

When compound interest was used Harish would pay ₹128 more on simple interest. Yes/No. Explain.

Using the steps of example 2 derive the formula for compound interest to solve the problems easily.

Name: _____

Worksheet-14

Skill: Problem Solving

Topic- Situations related to Compound interest

You derived the following formula to compute compound interest.

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

$$CI = A - P$$

Using this formula solve the given questions and explain the steps.

1. Find CI on ₹12600 for 2 years at 10% per annum compounded annually.

2. a. What happen when you will have to compute the compound interest calculated semi-annually i.e. half yearly?

Hint: Rate becomes half

2.b. Calculate the compound interest on ₹ 20,000 for $1\frac{1}{2}$ years at the rate of 10% per annum, when the interest is compounded semi-annually.

2.c. What amount is to be repaid on a loan of ₹12000 for $1\frac{1}{2}$ years at 10% per annum compounded half yearly?

3. a. What happen when you will have to compute the compound interest quarterly?

Hint: Rate will be one-fourth of the annual rate.

Class: 8	Subject: Mathematics	Topic: Comparing Quantities
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3.b. Calculate the compound interest on ₹20,000 for 9 months at the rate of 4% per annum, when the interest is compounded quarterly.

Period 11 and 12

Lesson Objectives

At the end of this lesson students will be able to:

- Use the derived formula of compound interest in solving the real life problems.
- Build an understanding related to computing half yearly and quarterly compound interest

Teaching Learning Materials required

- **Home assignment discussion: Worksheet-14** (1 per student);
- **KWL chart: Worksheet-15** (1 per student); projector (1 per class)

Details of Teaching Learning Experience

Seating Arrangement: - In groups of 4 to 6

Lesson Beginning <u>Time:</u> 15 min <u>Purpose:</u> Activate prior knowledge Generate interest to the topic Introduce the topic Develop conceptual understanding	<u>Home assignment discussion/Individual</u> • Provide annexure Worksheet-14. • Tell students that you are going to take up a discussion on previous day's home assignment. • At random ask students to share the answers of all the questions. • Ask the following questions: ○ How can you compute a compound interest or a year? ○ How can you compute the compound interest semi-annually? ○ How can you compute the compound interest quarterly? ○ What is the similarity and differences in computing these 3 types of compound interests? • Build a class consensus on all the answers of the questions. <i>Note: The intent here is to let students recapitulate the formula to compute compound interest annually and to understand how to compute compound interest semiannually or quarterly. It may happen that students come up with different or incorrect observations. In this case, ask other students who may have the correct analysis to explain and justify. It is important to build consensus on all the answers of the questions– this will help eradicate any errors</i>
Lesson Middle <u>Time:</u> 25 min <u>Purpose:</u> Introduce the topic Develop the conceptual understanding	<u>KWL chart/Groups</u> • Provide Worksheet-15 to each student in which they will have to write what they have learnt about simple and compound interest, difference and similarity between compound and simple interest and create real life applications where these interests are used. • Give them 10 to 15 minutes to complete the task. <u>Discussion/Groups</u> • Project Worksheet-15. • Held a class discussion and discuss the answers of all the questions. • Build a class consensus on what they have learnt related to compound interest, similarities and differences between compound and simple interest. <i>Note: It may happen that students come up with different or incorrect observations. In this case, ask other students who may have the correct analysis</i>

to explain and justify. It is important to build consensus on all the answers of the questions— this will help eradicate any errors. Also, make sure they will cover all the important points or information, which they have learnt till day about compound and simple interest.

- Collect the sheets for review.
- Check the situations made by them and give appropriate feedback.

Note: Make sure students come up with real life applications related to population, the value of an item, if its price increases or decreases in the intermediate years etc. If not then you can share such situations in the next class and held a discussion on the solution of such kind of situations. One example is given for your reference:

- The population of a city was 20,000 in the year 1997. It increased at the rate of 5% p.a. Find the population at the end of the year 2000.



$$\text{Increase at 5\%} = \frac{5}{100} \times 20000 = 1000$$

$$\text{Population in 1999} = 20000 + 1000 = 21000$$

Treat as the Principal for the 2nd year.

$$\text{Increase at 5\%} = \frac{5}{100} \times 21000 = 1050$$

$$\text{Population in 2000} = 21000 + 1050 = 22050$$

Treat as the Principal for the 3rd year.

$$\text{Increase at 5\%} = \frac{5}{100} \times 22050 = 1102.5$$

$$\text{At the end of 2000 the population} = 22050 + 1102.5 = 23152.5$$

or,
$$\text{Population at the end of 2000} = 20000 \left(1 + \frac{5}{100}\right)^3$$

$$= 20000 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20}$$

$$= 23152.5$$

So, the estimated population = 23153.

Lesson End

Time: 40 mins.

Purpose:

Consolidate students learning

Discussion/Whole class

- Give the reviewed **Worksheet-15** to each student.
- Shared with them that you have reviewed the sheets and problems/real life situations created by them.
- Discuss the good situations discovery of the process of their own with the entire class.

- Also at the same time discuss and correct their errors and doubts along with the reason of rectification and justification; that why a particular problem can't be related to compound and simple interest.
- Tell them to correct their problems on the basis of the discussion.

Solving the problems

- Tell the groups to exchange the problems with another group.
- They need to solve the problems in order to verify the problems created by their fellow groups.
- Give them 15 mins to discuss and solve the problems

Discussion/whole class

- Ask a few students from different groups at random to share the real life situations along with the solution and build consensus on all the answers.
- Ask the following questions from the representative groups/students:
 - How did you arrive at the answer? Give justification.

Note: students may come up with different or incorrect answers. In this case, ask other students who may have the correct answers to explain and justify. It is important to build consensus on all shared situations and answers – this will help eradicate any errors and familiarizing with the process of solving different kind of problems. The intent here is to provide an exposure of different kinds of real life problems/situations related to both kind of interests and bring into the focus on the process involved in solving these problems.

Home Assignment:

- Tell the students to practice questions on Pg 133-Exercise 8.3 of NCERT Textbook

Name: _____

Worksheet-15

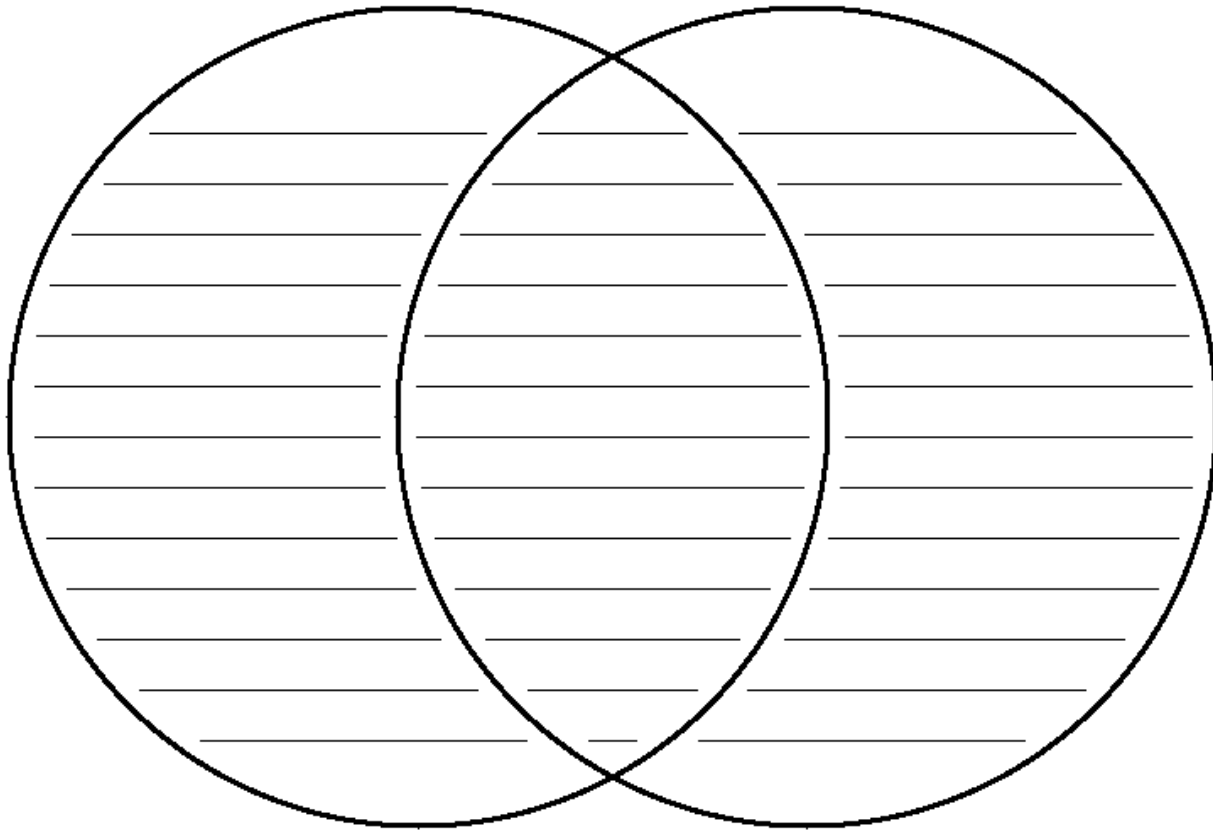
Skill: Logical Reasoning

Topic- Simple and Compound Interest

1. Fill in the given table:

I have learnt about simple and compound interest...

2. Write the similarities and differences in between simple and compound interest.



3. Create 2 real life situations related to simple and compound interest.

Class: 8	Subject: Mathematics	Topic: Comparing Quantities
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