

॥ Aum Sri Sai Ram ॥

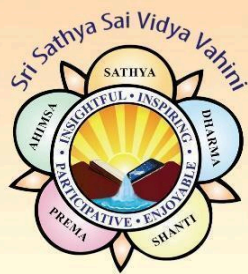
Sri Sathya Sai VIDYA VAHINI

श्री सत्यसाई विद्या वाहिनी



TOPIC	Algebraic Expressions
SUB-TOPIC	Finding the value of an Expression
DURATION	25 min

CURRICULAR GOALS	CG-2 Understands the concepts of variable, constant, coefficients, expression and (one-variable) equation, and uses these concepts to solve meaningful daily-life problems with procedural fluency	
COMPETENCIES AS PER NCF/NIPUN BHARAT	Remember	
	Understand	
	Apply	C-2.2 Extends the representation of a number in the form of a variable or an algebraic expression using a variable C-2.3 Forms algebraic expressions using variables, coefficients and constants and manipulates them through basic operations
	Analyse	C-2.5 Develops own methods to solve puzzles and problems using algebraic thinking
	Evaluate	
	Create	

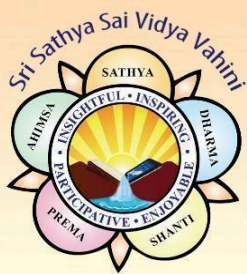


Strategies As Per NEP	Case Study
Learner Centric Techniques used	Think-Pair-Share
Teacher's Tool Kit	NA
SDG(Sustainable Development Goals)	SDG 4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Inter/Multidisciplinary elements	NA

Technology aids	NA
Teaching Learning Materials (TLM)	NA
Learning Aids	NA
Assessment (As, For, Of)	AFL through Case study AOL through Home assignment
References	NA

Previous Knowledge required	Knowledge of basic arithmetic operations, variables and constants.
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Brief Description : This module presents a **Case Study** for the concept of *Value of an Algebraic Expression*. This involves the business idea for a coffee shop where an algebraic expression is used to calculate the cost of a cup of coffee. Students evaluate the changes in the expression under different circumstances.



1) IQ_Algebraic Expression_Case Study

Specific Learning Outcome: Students will be able to evaluate changes in an algebraic expression and its value based on the provided case study. [Fulfills C-2.2 and C-2.3]

Duration : 25 min

CASE STUDY: The Coffee Shop

[Note to the teacher: Present the following case study to the students. Write down the algebraic expression given in B and the questions following the case study on the board. For the questions, the **Think-Pair-Share technique** can be used. Students may discuss the situation in pairs and write down their answers in a single document per pair. Randomly call out pairs to present their answers on the board.

Encourage them to explain their reasoning and calculations]

During the last 2-3 decades, we have seen these chains of shops open in different parts of India where the ambience supports long talks along with a cup of coffee/tea and some light snacks. These shops often sell the tea/coffee at a premium price that is higher than the roadside shops.

A startup company plans to open a similar chain of shops for selling a wide range of coffee varieties. The founder observed that the cost of making the coffee depended upon the following:

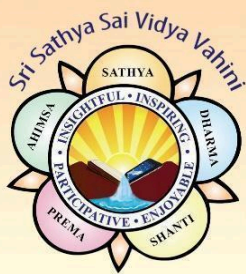
1. The cost of ingredients.
2. The location of the shop.

However, she wanted to standardise the price to give the same experience to her customers across all branches.

- A. Given below is an expression for estimating the price of one cup of coffee made using basic ingredients with varying proportions. Hence the quantity of milk(M), sugar(S), coffee powder(C) are variables.
- B. For a cup of coffee, price, $P = aM + bC + cS + K$
where a , b and c are constant numeric coefficients representing the cost of unit quantity of each ingredient and K is a constant representing the profit.

QUESTIONS:

1. Write the given expression using the following values for a , b , c and K
 $a = 9$, $b = 7$, $c = 4$, $K = 30$
2. What will be the price of a cup of coffee if one unit each of milk, coffee powder and sugar are used in making it?
3. The cost of coffee powder goes up. How will this change the algebraic equation?
 - a. The constant ' b ' will increase.
 - b. The constant ' b ' will decrease.
 - c. The profit K will decrease.



4. The cost of milk and coffee powder go up at the same time. But the owner feels that increasing the price of a cup of coffee or lowering the quality of coffee will lead to losing customers, so he sells it at the same price. Which values will change and how will they change in the expression?
 - a. The value of c will increase.
 - b. The values of a , b will increase and the value of K will decrease.
 - c. There will be no change in any value.
5. Shanti visited a newly opened coffee shop and ordered 1 cup of coffee for herself and 2 brownies for her children. If the price of a cup of coffee is ₹. x and that of a brownie is ₹. y , write the algebraic expression for the amount to be paid by Shanti.

2) IA_Riddle Time with Algebra

Specific Learning Outcome: Students will be able to appreciate the algebraic expressions behind riddles and enjoy solving such riddles.(FulfillsC-2.5)

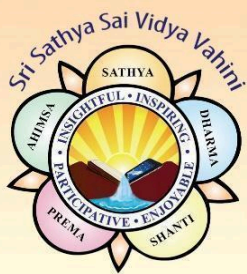
Duration: 10 min

Notes to the teacher: Present the riddle on the board stepwise as given below and ask students to do the calculations in their notebook. Share their amazement when their numbers are correctly revealed at the end. Then explain the algebraic expression that was used to create the riddle]

Steps:

1. Write down the number of doors in your house. (It should be a single digit number)
2. Write down the number of windows in your house. (It should be a single digit number)
3. Now add 2 to the number of doors.
4. Multiply what you get in step 3 by 2.
5. Add 1 to the above result
6. Now multiply above result by 5
7. Add the number of windows to it
8. Subtract 25 from the above result
9. You will arrive at a two digit number.
10. The digit on the left(Tens place) will be the number of doors.
11. The digit on the right(Units place) will be the number of windows.

Students may play with their partners once more to enhance their wonder. Instead of doors and windows, they may use uncles and aunts, brothers and sisters, etc.



Explanation:

Step 1: Let the number of doors be x .

Step 2: Let the number of windows be y .

Step 3: We get $x + 2$

Step 4: We get $2x + 4$

Step 5: We get $2x + 5$

Step 6: We get $10x + 25$

Step 7: We get $10x + 25 + y$

Step 8: We get $10x + y$

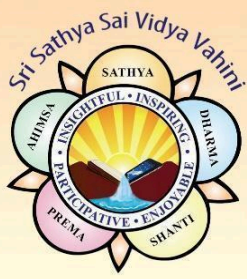
Thus we get the number of doors in the tens place and number of windows in the units place!!!

3) QA_Algebraic Expressions(Home assignment)

Specific Learning Outcome: Students will be able to apply their knowledge of algebraic expressions to solve problems.

Duration: 10 min

[Note to the teacher: Provide the attached worksheet “**EM_LA_Algebraic Expressions_Worksheet.pdf**” to the students as a take-home assignment to reinforce their understanding of the lesson. It can also be taken up in the next class period to assess the understanding.]



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