

# Teacher Teaching Plan

Topic: Letter-Numbers and Algebraic Expressions

## 1. Topic Overview

This topic covers the concept of letter-numbers and algebraic expressions, where students will learn to represent mathematical relations and patterns using variables and constants.

They will understand how to write algebraic expressions and solve simple equations to find unknown values.

By the end of this topic, students will be able to apply this knowledge to solve real-life problems.

## 2. Learning Objectives

- Students will understand the concept of letter-numbers and algebraic expressions.
- Students will be able to write algebraic expressions to represent mathematical relations and patterns.
- Students will learn to use variables and constants in algebraic expressions.

## 3. Textbook Examples (Direct Extraction)

*Note from Textbook: Shabnam's age = Aftab's age + 3. If  $a$  is 23 (Aftab's age in years), then what is Shabnam's age?*

*Note from Textbook: Aftab's age = Shabnam's age – 3. If we again use the letter  $a$  to denote Aftab's age and the letter  $s$  to denote Shabnam's age, then the algebraic expression would be:  $a = s - 3$ , meaning 3 less than  $s$ .*

*Note from Textbook: Number of matchsticks =  $2 \times$  Number of L's*

## 4. Prerequisites

Students should have a basic understanding of arithmetic operations, variables, and simple equations.

## 5. Teaching Plan (Step-by-Step)

**5 mins:** Intro to letter-numbers and algebraic expressions.

**10 mins:** Explain the concept of variables and constants in algebraic expressions.

**15 mins:** Activity - Use real-life examples to demonstrate how to write algebraic expressions and solve simple equations (e.g., Shabnam's age = Aftab's age + 3).

**15 mins:** Activity - Use matchstick problem to illustrate the concept of variables and constants.

**10 mins:** Summarize key points and provide examples for students to try.

## 6. Explanation (Level-Aware)

In algebra, we use letters to represent numbers. These letters are called letter-numbers. Algebraic expressions are mathematical statements that contain letter-numbers, variables, and constants. The expression  $a + 3$  is an example of an algebraic expression. In this expression,  $a$  is a variable, and 3 is a constant. Variables are used to represent unknown values, and constants are fixed numbers. By using variables and constants, we can write algebraic expressions to represent mathematical relations and patterns.

## 7. Additional Worked Examples

{'problem': 'If Aftab's age is represented by  $a$  and Shabnam's age is represented by  $s$ , and Shabnam's age is 3 more than Aftab's age, then what is Shabnam's age if Aftab is 23 years old?', 'solution': 'Since Shabnam's age is 3 more than Aftab's age, we can write the algebraic expression as  $s = a + 3$ . Given that Aftab is 23 years old, we can substitute  $a$  with 23 in the expression:  $s = 23 + 3$ . Solving for  $s$ , we get  $s = 26$ .'}  
{'problem': 'If 2 matchsticks are needed for every  $L$ , how many matchsticks are needed for 5  $L$ s?', 'solution': 'Since 2 matchsticks are needed for every  $L$ , we can multiply the number of  $L$ s by 2 to get the total number of matchsticks needed. For 5  $L$ s, the total number of matchsticks needed is  $5 \times 2 = 10$ .'}}

## 8. Classroom Questions

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- What is the difference between a variable and a constant in algebraic expressions?
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- Can you write an algebraic expression to represent the statement 'Tom has 5 more pencils than John'?
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- How many matchsticks are needed for 3  $L$ s if 2 matchsticks are needed for every  $L$ ?

## 9. Homework / Practice

Write an algebraic expression to represent the statement 'Sarah has 2 more books than Emily'.

If a pencil costs \$2 and a pen costs \$3, write an algebraic expression to represent the total cost of 5 pencils and 3 pens.

If it takes 5 apples to make a pie and you have 15 apples, write an algebraic expression to represent the number of pies you can make.

## 10. Assessment Checklist

- Can students identify variables and constants in algebraic expressions?
- Can students write algebraic expressions to represent mathematical relations and patterns?
- Can students solve simple equations to find unknown values?
- Can students apply algebraic expressions to solve real-life problems?