

# LESSON PLAN 10

**TEACHER'S  
NAME :**

**SUBJECT: MATHEMATICS**

**CLASS: 7**

**UNIT : ALGEBRAIC EXPRESSIONS**

**No.of Periods: 9+10=19**

## PERIOD ALLOTMENT

NAME OF THE UNIT	SUB-TOPICS	NO OF PERIODS REQUIRED			Time line for teaching	
		Teaching	Practice	TOTAL	From	To
<b>ALGEBRAIC EXPRESSIONS</b>	10.1 PRE-REQUISITES & INTRODUCTION	1	1	2		
	10.2 HOW ARE EXPRESSIONS FORMED?	4	4	8		
	10.3 TERMS OF AN EXPRESSION					
	10.4 LIKE AND UNLIKE TERMS					
	10.5 MONOMIALS, BINOMIALS, TRINOMIALS AND POLYNOMIALS	4	5	9		
	10.6 FINDING THE VALUE OF AN EXPRESSION	9	10	19		
TOTAL						

### PRE-REQUISITES OF THE LESSON

### LEARNING OUTCOMES

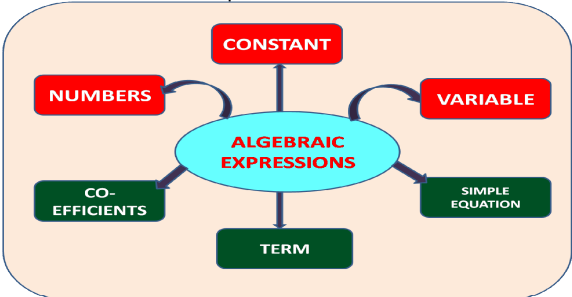
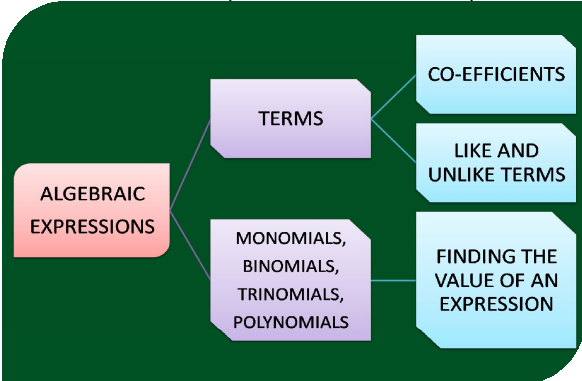
Every Pupil is expected to have basic knowledge in

- # Different number systems like Natural Numbers, Whole Numbers & Integers
- # four basic operations +, -, x, ÷
- # simple equations and their solutions like  $x+3=5$ , etc (from class VI)
- # terminology related to algebraic expressions like variable, constant, expression, co-efficient, power(square) etc.,

After Completion of this lesson every student will be able to

- # explain what an expression is?
- # convert word sums into expressions and vice versa
- # discriminate between like terms and unlike terms
- # identify the monomials, binomials, trinomials and polynomials from the given set.
- # calculate the value of an expression at the given parameters
- # appreciate the utility of "Algebraic Expressions" in real life sums

## TEACHING PERIOD : 1 ( PRE - REQUISITES & INTRODUCTION )

CONCEPTS/STEPS	TEACHER ACTIVITY ( I DO )	GROUP ACTIVITY ( WE DO )	INDIVIDUAL ACTIVITY ( YOU DO )
PRE REQUISITES	Brain storming session involving children with pre-requisites vocabulary and concepts related to previous knowledge. Introduction of new vocabulary and key words associated with the concept through questioning # constant # variable #terms #algebraic expression # simple equation #coefficients	* Students read the pre-requisites and answer the questions to the teacher (whole class activity)	Every Pupil will read and write the key words in their note books
MIND MAPPING	Teacher writes the key word " ALGEBRAIC EXPRESSIONS" on the black board and will elicit its other related words through 	Hetrogeneous groups are created. One group will read the words and other will explain the meaning	Pupils individually read the keywords associated with the lesson
RELEVANCE OF THE LESSON	Teacher conducts a discussion on the importance of the lesson through questioning ex. 1.Can you give examples of simple equations that you have learnt in class VI? 2. In the equation $X-5=9$ , what is "X" called and what are 5,9 called? 3. What does it mean by "3y" 4. "Bhaavajna has 5 chocolate more than what Vidhijna has". Can you convert this into an expression?	Students participate in the discussion and ask questions among themselves and give answers	Pupils individually write their responses to the questions asked
CONCEPT MAP	Teacher displays the concept map depicting various concepts that pupil are going to learn in this lesson 	Whole class read the concept map	
ASSESSMENT	Teacher gives some real life situations and asks children to convert them into algebraic expressions using their previous knowledge.	every group will do the task by discussion among each other	every individual solves the task on their own

## PRACTICE PERIOD: 1

CONCEPTS/STEPS	TEACHER ACTIVITY (I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY (YOU DO)														
KEY WORDS READING	Teacher writes the key words from previous class's teaching period and asks children to read and write them in note books # constant # variable #terms #algebraic expression # simple equation #coefficients	Students read these key words in groups and will try to give examples to each key word	Every child comes to the board and reads the key words and notes them down in their note books														
SIMILAR LINES READING	Teacher writes some algebraic expressions and writes them in words and vice versa and asks children to solve some more $7y+5 \implies 5$ more than 7 times of "y" $x/3 \implies$ one third of "x" Three less than twice "z" $\implies 2z-3$ four added to two third of "m" $\implies 4+2y/3$	Each group will observe the similar lines and will frame some more by discussion	Every Individual will frame some more using similar lines														
<table border="1" style="margin: auto;"> <thead> <tr> <th style="background-color: #e2efda;">Word Problem</th> <th style="background-color: #e2efda;">Algebraic Expression</th> </tr> </thead> <tbody> <tr> <td>5 times a number</td> <td><math>(5 \bullet n)</math> or <math>(n \bullet 5)</math> or <math>5n</math></td> </tr> <tr> <td>The product of 3 and a number</td> <td><math>(3 \bullet n)</math> or <math>(n \bullet 3)</math> or <math>3n</math></td> </tr> <tr> <td>Twice a number</td> <td><math>(2 \bullet n)</math> or <math>(n \bullet 2)</math> or <math>2n</math></td> </tr> <tr> <td>A number doubled</td> <td><math>(2 \bullet n)</math> or <math>(n \bullet 2)</math> or <math>2n</math></td> </tr> <tr> <td>A number multiplied by 9</td> <td><math>(n \bullet 9)</math> or <math>(9 \bullet n)</math> or <math>9n</math></td> </tr> <tr> <td>2/3 of a number</td> <td><math>2/3 \bullet n</math> or <math>2/3n</math></td> </tr> </tbody> </table>				Word Problem	Algebraic Expression	5 times a number	$(5 \bullet n)$ or $(n \bullet 5)$ or $5n$	The product of 3 and a number	$(3 \bullet n)$ or $(n \bullet 3)$ or $3n$	Twice a number	$(2 \bullet n)$ or $(n \bullet 2)$ or $2n$	A number doubled	$(2 \bullet n)$ or $(n \bullet 2)$ or $2n$	A number multiplied by 9	$(n \bullet 9)$ or $(9 \bullet n)$ or $9n$	2/3 of a number	$2/3 \bullet n$ or $2/3n$
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2/3 of a number	$2/3 \bullet n$ or $2/3n$																
SUMMARY/ SYNOPSIS	Teacher writes synopsis of the lesson on board and asks children to read,write, discuss and practice.	pupils will note down and read the summary in groups	every individual spells and reads the summary and notes it down														
WRITING/ EDITING	Teacher conducts a dictation on key words ,pre-requisites and gives some questions and asks children to exchange books for editing after writing is finished.	One group will check the writings of the other and vice versa	Slow learners are focused and teacher will ascertain that every individual learns the														

TEACHING PERIODS : 2 to 5 ( HOW ARE EXPRESSIONS FORMED?, TERMS OF AN EXPRESSION, LIKE AND UNLIKE TERMS)															
CONCEPTS/STEPS	TEACHER ACTIVITY ( I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY ( YOU DO)												
<p><b>KEY WORDS</b></p>	<p>Brain storming session involving children with key words            # Expression # Terms # Factors # Square # cube # Like terms # Unlike Terms            # Numerical coefficients</p>	<p>* Students read the keywords answer the questions to the teacher (whole class activity)</p>	<p>Every Pupil will read and write the key words in their note books</p>												
<p><b>CONCEPTUAL UNDERSTANDING</b></p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>What is an Algebraic Expression</p> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p><b>Algebraic Terms</b></p> <pre> graph TD     A[Algebraic Terms] --&gt; B[Like terms]     A --&gt; C[Unlike terms]     B --&gt; D[3x + 7x]     C --&gt; E[3x + 7y]           </pre> </div> <p>Teacher recalls the basic terminology related with algebraic expressions like variable, constant etc., and demonstrates how an expression is formed by using the combination of variables and constants. Later teacher conducts an activity involving heterogeneous groups where each group will be provided with a number of card tiles labelled with "x", "y", "x<sup>2</sup>", "y<sup>2</sup>", "+1" "-1" are asked to form different expressions by combining these labelled cards with basic mathematical operations. Teacher will form some exemplary algebraic expressions. After this session teacher explains the differences between like and unlike terms and gives some examples to aggregate the</p>	<p>Each group will understand the concepts by participation in the activity</p>	<p>every child learns the concept through the learning activity and observation of TLM</p>													
<p><b>LEARNING ACTIVITY</b></p>	<p>Teacher once again writes important key words and procedures and asks children to note down and adopt.</p>	<div style="border: 2px solid purple; border-radius: 20px; padding: 10px; background-color: #e0f0ff;"> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>DIFFERENT EXPRESSIONS FORMED BY ABOVE TILES</b></p> <table style="width: 100%; text-align: center;"> <tr> <td><math>2x^2-3y+4</math></td> <td><math>5x^2+6</math></td> <td><math>-2y^2+5y-3</math></td> </tr> <tr> <td><math>-3y-8</math></td> <td><math>2x^2-5y^2+y-1</math></td> <td><math>-x^2-y-4</math></td> </tr> <tr> <td><math>4y^2+7y-4</math></td> <td><math>-3x^2-4y-5</math></td> <td><math>-9x+4</math></td> </tr> <tr> <td><math>2x^2-3y^2+4</math></td> <td><math>8x^2+3y-9</math></td> <td><math>5x^2+2y-6</math></td> </tr> </table> </div> </div>	$2x^2-3y+4$	$5x^2+6$	$-2y^2+5y-3$	$-3y-8$	$2x^2-5y^2+y-1$	$-x^2-y-4$	$4y^2+7y-4$	$-3x^2-4y-5$	$-9x+4$	$2x^2-3y^2+4$	$8x^2+3y-9$	$5x^2+2y-6$	<p>Every individual reads the summary and notes it down and adopts the procedure</p>
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$-3y-8$	$2x^2-5y^2+y-1$	$-x^2-y-4$													
$4y^2+7y-4$	$-3x^2-4y-5$	$-9x+4$													
$2x^2-3y^2+4$	$8x^2+3y-9$	$5x^2+2y-6$													
<p><b>SUMMARY</b></p>	<p>Teacher gives some questions from Try These sections as well as some examples and asks children to solve those sums</p>	<p>Pupils will note down and read the summary in groups</p>	<p>Every individual solves the sums on their own</p>												
<p><b>ASSESSMENT</b></p>	<p>Teacher gives some questions from Try These sections as well as some examples and asks children to solve those sums</p>	<p>Every group will do the sums by discussion among each other</p>	<p>Every individual solves the sums on their own</p>												

PRACTICE PERIODS : 2 to 5 ( HOW ARE EXPRESSIONS FORMED?, TERMS OF AN EXPRESSION, LIKE AND UNLIKE TERMS)															
CONCEPTS/STEPS	TEACHER ACTIVITY ( I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY ( YOU DO )												
KEY WORDS READING	Teacher writes the key words from previous class's teaching period and asks children to read and write them in note books # Expression # Terms # Factors # Square # cube # Like terms # Unlike Terms # Numerical coefficients	Whole class activity : one child comes to the board and reads the key words loudly and the remaining class follows.	Every child comes to the board and reads the key words and notes them down in their note books												
SIMILAR LINES READING	Teacher will write some algebraic expressions on the black board and ask children to give some more examples. Later teacher saggregates like terms and unlike terms among them and asks children too to do some more by watching similar lines	Each group will read the similar lines and will frame some more by discussion	Every Individual will do a few more by watcing similar lines												
<div style="border: 1px solid red; padding: 5px; margin: 5px;"> <math>7x - 2</math>  <math>5a + 3b</math>  <math>2.6u + 3v - 8</math>  <math>\frac{4}{7}l + 3m - 2</math>  <math>2y^2 - 3y + 8</math> </div>	<div style="border: 1px solid green; padding: 5px; margin: 5px;"> <p style="text-align: center; background-color: #4CAF50; color: white; margin: 0;">Like And Unlike Algebraic Terms</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #4CAF50; color: white;">Like Terms</th> <th style="background-color: #9C27B0; color: white;">Unlike Terms</th> </tr> </thead> <tbody> <tr> <td><math>2x + 19x</math></td> <td><math>2x + 19a</math></td> </tr> <tr> <td><math>4w - 10w</math></td> <td><math>4w - 10w^2</math></td> </tr> <tr> <td><math>14.2r - 12r</math></td> <td><math>12r - 12s</math></td> </tr> <tr> <td><math>32a^2 + 9a^2</math></td> <td><math>32a^2 + 9a^3</math></td> </tr> <tr> <td><math>8y + 5y</math></td> <td><math>8y + 5</math></td> </tr> </tbody> </table> </div>	Like Terms	Unlike Terms	$2x + 19x$	$2x + 19a$	$4w - 10w$	$4w - 10w^2$	$14.2r - 12r$	$12r - 12s$	$32a^2 + 9a^2$	$32a^2 + 9a^3$	$8y + 5y$	$8y + 5$	<div style="border: 1px solid blue; padding: 5px; margin: 5px;"> <p style="text-align: center; color: red; margin: 0;"><b>Like Terms - EXAMPLES</b></p> <p>Decide if the terms in each pair of items are "Like Terms".</p> <ol style="list-style-type: none"> <li>1) <math>4g</math> and <math>4h</math> _____</li> <li>2) <math>3h</math> and <math>-h</math> _____</li> <li>3) <math>5x</math> and <math>4xy</math> _____</li> <li>4) <math>2x^2y^3</math> and <math>2x^2y^5</math> _____</li> <li>5) <math>5p^2q^3</math> and <math>-4p^2q^3</math> _____</li> </ol> </div>	
Like Terms	Unlike Terms														
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$4w - 10w$	$4w - 10w^2$														
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SUMMARY/ SYNOPSIS	Teacher once again writes important key words and definitions and asks children to note down and adopt.	Pupil groups will read and adopt the procedure	Teacher focuses on every individual so that every child is able to												
WRITING/ EDITING	Teacher gives some questions from examples and exercise 10.1 and asks children to solve those sums and teacher checks the writings of children	One group will check the writings of the other and vice versa	learn the concept in successive upcoming practice sessions												

TEACHING PERIODS : 6 to 9	MONOMIALS, BINOMIALS, TRINOMIALS AND POLYNOMIALS, FINDING THE VALUE OF AN EXPRESSION														
CONCEPTS/STEPS	TEACHER ACTIVITY (I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY (YOU DO)												
KEY WORDS	Brain storming session involving children with key words # Monomial # Binomial # Trinomial # Multinomial # Polynomial # Value of an expression	* Students read the keywords answer the questions to the teacher (whole class activity)	Every Pupil will read and write the key words in their note books												
CONCEPTUAL UNDERSTANDING	Teacher demonstrates about monomials, binomials, trinomials, multinomials and polynomials by some exemplary illustrations and engages children in an activity of preparing different examples for each by dividing them into groups. Later teacher explains how we can find the value of a polynomial at a given value of each variable in it with some illustrations and will make children engaged themselves in finding values for some example sums.	Each group will understand the concepts by participation in the activity	every child learns the concept through the learning activity and observation of TLM												
LEARNING ACTIVITY	<div style="border: 1px solid red; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center; color: white; font-weight: bold;">Value of a Polynomial at a value of variable</p> <p style="font-size: small; color: white;">If we substitute the variable in a Polynomial with a value of the variable in the Polynomial, then we will find out the value of the Polynomial at that value of the variable.</p> <math display="block">p(x) = 2x^2 - 5x - 2</math> <math display="block">p(0) = 2(0)^2 - 5(0) - 2 = 0 - 0 - 2 = -2</math> <math display="block">p(1) = 2(1)^2 - 5(1) - 2 = 2 - 5 - 2 = -5</math> <math display="block">p(2) =</math> </div> <div style="border: 1px solid blue; padding: 10px;"> <table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="border: 1px solid green; padding: 5px;"><b>Monomial</b></td> <td style="border: 1px solid green; padding: 5px;"><b>Binomial</b></td> <td style="border: 1px solid blue; padding: 5px;"><b>Trinomial</b></td> <td style="border: 1px solid purple; padding: 5px;"><b>Four-Term Polynomial</b></td> </tr> <tr> <td style="border: 1px solid green; padding: 5px;">one term</td> <td style="border: 1px solid green; padding: 5px;">two terms</td> <td style="border: 1px solid blue; padding: 5px;">three terms</td> <td style="border: 1px solid purple; padding: 5px;">four terms</td> </tr> <tr> <td style="border: 1px solid green; padding: 5px;"><math>-2x^5</math></td> <td style="border: 1px solid green; padding: 5px;"><math>x^2 + 5</math></td> <td style="border: 1px solid blue; padding: 5px;"><math>3x - 8 + 4x^5</math></td> <td style="border: 1px solid purple; padding: 5px;"><math>-7a^2 + 9b - 4b^3 + 6</math></td> </tr> </table> </div>			<b>Monomial</b>	<b>Binomial</b>	<b>Trinomial</b>	<b>Four-Term Polynomial</b>	one term	two terms	three terms	four terms	$-2x^5$	$x^2 + 5$	$3x - 8 + 4x^5$	$-7a^2 + 9b - 4b^3 + 6$
<b>Monomial</b>	<b>Binomial</b>	<b>Trinomial</b>	<b>Four-Term Polynomial</b>												
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SUMMARY	Teacher once again writes important key words and procedures and asks children to note down and adopt.	Pupils will note down and read the summary in groups	Every individual reads the summary and notes it down and adopts the												
ASSESSMENT	Teacher gives some questions from Try These sections and exercise 10.2 as well as some examples and asks children to solve those sums	Every group will do the sums by discussion among each other	Every individual solves the sums on their own												

PRACTICE PERIODS : 6 to 10		MONOMIALS, BINOMIALS, TRINOMIALS AND POLYNOMIALS, FINDING THE VALUE OF AN EXPRESSION	
CONCEPTS/STEPS	TEACHER ACTIVITY ( I DO )	GROUP ACTIVITY ( WE DO )	INDIVIDUAL ACTIVITY ( YOU DO )
KEY WORDS READING	Teacher writes the key words from previous class's teaching period and asks children to read and write them in note books #Monomial # Binomial # Trinomial # Multinomial # Polynomial # Value of an expression	Whole class activity : one child comes to the board and reads the key words loudly and the remaining class follows.	Every child comes to the board and reads the key words and notes them down in their note books
SIMILAR LINES READING	Teacher finds the value of some polynomials at the given value of a variable and asks children to find some more by watching similar lines.	Each group will read the similar lines and will frame some more by discussion	Every Individual will do a few more by watching similar lines
<p>Find the value of the polynomial <math>5x - 4x^2 + 3</math> at (iii) <math>x = 2</math></p> <p>Let <math>p(x) = 5x - 4x^2 + 3</math></p> <p>Putting <math>x = 2</math></p> $p(2) = 5 \times (2) - 4 \times (2)^2 + 3$ $= 10 - 4 \times (4) + 3$ $= 10 - 16 + 3$ $= -3$		<p>II. Find the value of algebraic expression</p> <p>1. If <math>x=7, y=3</math> then what is the value of <math>2x-3y+9</math></p> <p>2. If <math>p=-3, q=0</math> then what is the value of <math>q-p+pq</math></p> <p>3. If <math>a=4, b=-9, c=3</math> then what is the value of <math>3a-2b+3c+60</math></p>	
SUMMARY/ SYNOPSIS	Teacher once again writes important key words and definitions and asks children to note down and adopt.	Pupil groups will read and adopt the procedure	Teacher focuses on every individual so that every child is able to learn the concept in successive upcoming practice sessions
WRITING/ EDITING	Teacher gives some questions from Exercise 10.2 and asks children to solve those sums and teacher checks the writings of children	One group will check the writings of the other and vice versa	