LESSON PLAN 8

CLASS : 8   TEACHER'S NAME :

NAME OF THE UNIT	SUB-TOPICS	NO OF PERIODS REQUIRED			Time line for teaching	
		Teaching	Practice	TOTAL	From	To
ALGEBRAIC EXPRESSIONS & IDENTITIES	8.1 WHAT ARE EXPRESSIONS? 8.2 TERMS, FACTORS AND COEFFICIENTS 8.3 MONOMIALS, BINOMIALS AND POLYNOMIALS 8.4 LIKE AND UNLIKE TERMS 8.5 ADDITION AND SUBTRACTION OF ALGEBRAIC EXPRESSIONS: INTRODUCTION	3	4	7		
	8.6 MULTIPLICATION OF ALGEBRAIC EXPRESSIONS: INTRODUCTION 8.7 MULTIPLYING A MONOMIAL BY A MONOMIAL 8.7.1 MULTIPLYING TWO MONOMIALS 8.7.2 MULTIPLYING THREE OR MORE MONOMIALS 8.8 MULTIPLYING A MONOMIAL BY A POLYNOMIAL 8.8.1 MULTIPLYING A MONOMIAL BY A BINOMIAL 8.8.2 MULTIPLYING A MONOMIAL BY A TRINOMIAL 8.9 MULTIPLYING A POLYNOMIAL BY A POLYNOMIAL 8.9.1 MULTIPLYING A BINOMIAL BY A BINOMIAL 8.9.2 MULTIPLYING A BINOMIAL BY A TRINOMIAL	4	5	9		
	8.10 WHAT IS AN IDENTITY? 8.11 STANDARD IDENTITIES 8.12 APPLYING IDENTITIES	2	2	4		
	TOTAL	9	11	20		

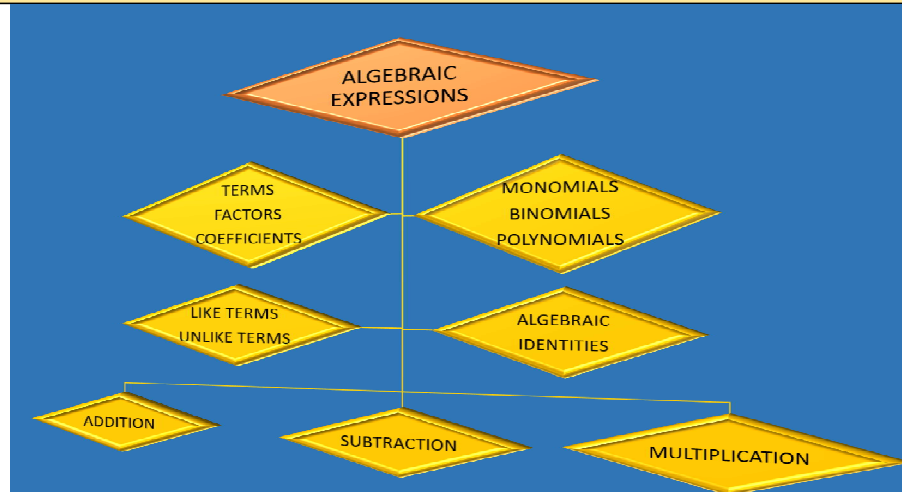| PRE-REQUISITES	KEY CONEPTS	KEY VOCABULARY	
	Every Pupil is expected to have basic knowledge in # terminology related with algebra like term, constant, variable, exponent etc., # mathematical operations like +, -, x, ÷ # converting word problems into expressions and vice versa # finding factors and multiples for numbers	# Algebraic expression # Numerical expression # Term # Constant # Variable # factor # Co-efficient # Monomial	# Binomial # Trinomial # Polynomial # Like terms # Unlike terms # Pattern # Identity

LEARNING OUTCOMES

After Completion of this lesson every student will be able to

identify algebraic expressions and define terms of it like constant, variable, co-efficient, exponent, factor etc.,

perform addtion and subtraction and multiplications on algebraic expression

convert real life sums into algebraic expression and will solve sums related to it.

utilize algebraic identities in solving sums involving usage of identities

adopt some simple techniques using identities to find out square roots easily.

recognize the significance and appreciate the importance of Algebraic expressions and identities in real life situations.
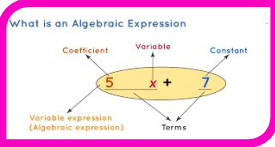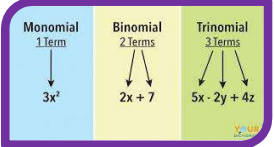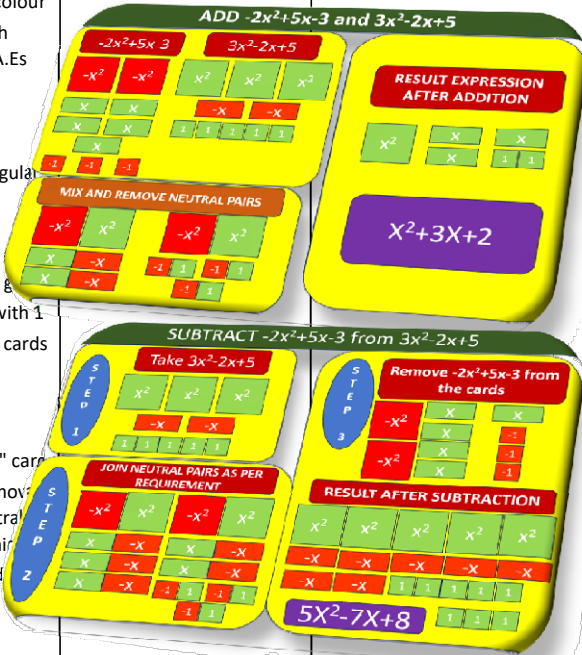
Teaching Learning Process

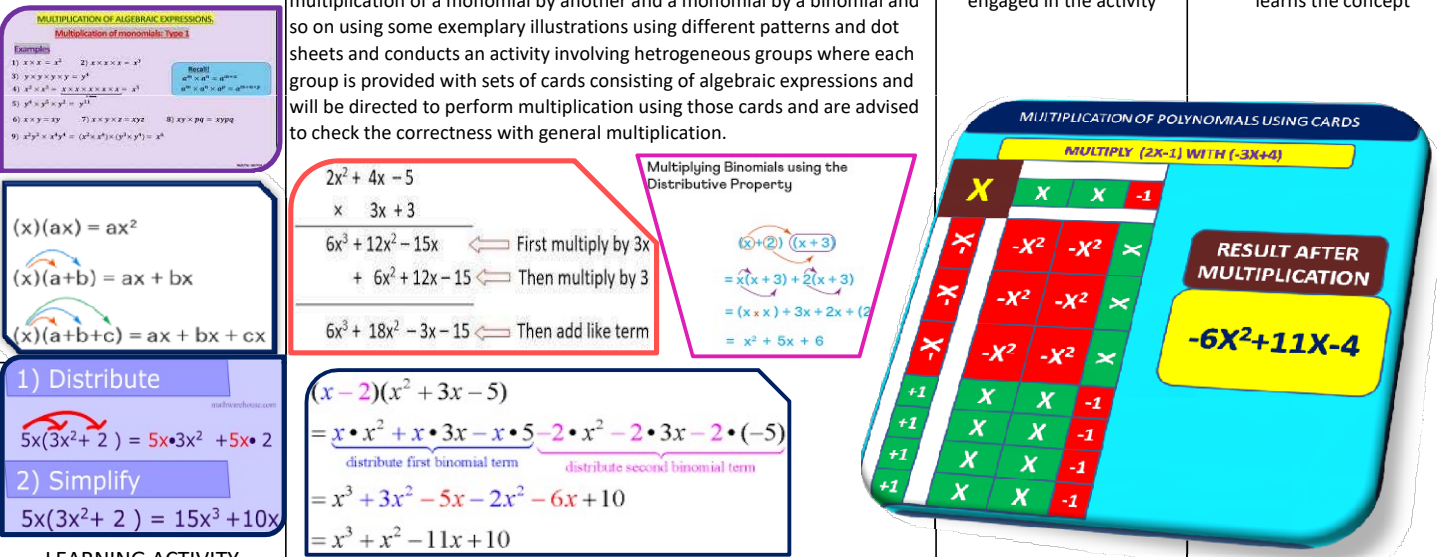| MIND MAPPING	Experience & Reflection
	# Pupils will recollect their knowledge on terms, constants, variables and expressions from their previous classes and will exercise that knowledge in exploring further more new concepts in Algebraic Expressions # Students will experience the usage of Algebraic expressions and Identities in real life situations.

TEACHING PERIOD : 1,2,3	WHAT ARE EXPRESSIONS?, TERMS, FACTORS AND COEFFICIENTS, MONOMIALS, BINOMIALS AND POLYNOMIALS, LIKE AND UNLIKE TERMS, ADDITION AND SUBTRACTION OF ALGEBRAIC EXPRESSIONS: INTRODUCTION		
CONCEPTS/STEPS	TEACHER ACTIVITY (I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY (YOU DO)
KEY WORDS & PRE REQUISITES	Brain storming session invoving children with pre-requisites vocabulary and concepts related to previous knowledge. Introduction of new vocabulary and key words associated with the concept # Algebraic expression # Numerical Expression # term # constant # Variable # Factor # Coefficient # Monomial # Binomial # Trinomial # Polynomial # Like terms # Unlike terms	* 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 elict its other related words through questioning and will draw pupils' attention towards key concepts in the lesson	Hetrogeneous groups are created. One group will read the words and other will explain the meaning	Pupils individually read the keywords associated with the chapter
CONCEPTUAL UNDERSTANDING & LEARNING ACITIVITY	Teacher recalls previous knowledge of children on expressions which they were familiar with in different concepts related to algebra like, simple equations in class VII, Linear Equation in 1 variable in class VIII. Teacher once again explains about term,constant, varaible, factors, coefficients, like terms and unlike terms. Later teacher conducts an activity involving groups where each group is given a set of cards being printed with x^2, x, +1 in green colour and -x^2,-x,-1 in red colour according to their respective sizes. Now each group will be given sums related to addition and subtraction of some A.Es duly exhibiting an exemplary addition and subtraction. **Addition of Algebraic expression using cards given in maths tool kit** ex: Adding -2x^2+5x-3 and 3x^2-2x+5 For this we pick up 2 red square shaped " x^2 "cards and 5 green rectangular shaped "x" cards and 3 red colour "1" card tiles. Similary in the second expression we pick up 3 green colour square shaped" x^2 " cards, 2 rectangular shaped "x" cards and 5 green colour "1" card tiles. We mix these cards as we need to add them. Now remove each neutral pair of green and red colour cards of each term of x^2,x and 1 and finally we are left with 1 green colour "x^2" card, 3 green colour "x" cards and 2 green colour "1" cards which makes x^2+3x+2 **Subtraction of Algebraic expression using cards in maths tool kit** ex:Sub tract -2x^2+5x-3 from 3x^2-2x+5 For this we pick up 3 green " x^2 " cards, 2 red "x" cards and 5 green "1" card tiles. As we don't have red -x^2 or green +x cards or red -1 cards for removing from the taken set of cards we now join proportionate number of neutral pairs as per our requirement of subtraction. As since joining neutral pairs not effect the taken expression 3x^2-2x+5 we now remove 2 red -x^2 cards green x cards, 3 red -1 cards and finally we are left with 5x^2-7x+8	Hetrogeneous groups are formed to participate in the activities	Each student in the group participates in the activities and learns the concepts of converting ratiios into percentages and vice versa along with finding discounts
SUMMARY	Teacher writes the summary of the concept in a step wise procedure and asks children to note and read	pupils will note down and read the summary in groups	every individual reads the summary and notes it down
ASSESSMENT	Teacher asks children to solve the sums of try these section, Think Discuss & Write along with example sums and exercise sums of 8.1	every group will do the sums by discussion among each other	every individual solves the sums on their own

PRACTICE PERIOD: 1 to 4	WHAT ARE EXPRESSIONS?, TERMS, FACTORS AND COEFFICIENTS, MONOMIALS, BINOMIALS AND POLYNOMIALS, LIKE AND UNLIKE TERMS, ADDITION AND SUBTRACTION OF ALGEBRAIC EXPRESSIONS: INTRODUCTION		
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 # Algebraic expression # Numerical Expression # term # constant # Variable # Factor # Coefficient # Monomial # Binomial # Trinomial # Polynomial # Like terms # Unlike terms	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 performs some additions and subtractions of algebraic expression on black board and guides children in doing some more by watching similar lines	Each group will read the similar lines and will frame some more by discussion	Every Individual prepares their own similar lines using the lines prepared by the teacher
SUMMARY/ SYNOPSIS	Teacher once again writes important key words and summary of the concept and asks children to read,note down 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 guides children in doing sums of exercise 8.1 on their own and checks their writings	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 concept in the forth coming practice sessions

	MULTIPLICATION OF ALGEBRAIC EXPRESSIONS: INTRODUCTION, MULTIPLYING A MONOMIAL BY A MONOMIAL, MULTIPLYING TWO MONOMIALS,MULTIPLYING THREE OR MORE MONOMIALS, MULTIPLYING A MONOMIAL BY A POLYNOMIAL, MULTIPLYING A MONOMIAL BY A BINOMIAL, MULTIPLYING A MONOMIAL BY A TRINOMIAL, MULTIPLYING A POLYNOMIAL BY A POLYNOMIAL, MULTIPLYING A BINOMIAL BY A BINOMIAL, MULTIPLYING A BINOMIAL BY A TRINOMIAL		
CONCEPTS/STEPS	**TEACHER ACTIVITY (I DO)**	**GROUP ACTIVITY (WE DO)**	**INDIVIDUAL ACTIVITY (YOU DO)**
KEY WORDS	Brain storming session invoving children with key words # Multiplication of Algebraic Expressions # Pattern # Identity	* Students read the keywords answer the questions to the teacher	Every Pupil will read and write the key words in their note books
CONCEPTUAL UNDERSTANDING LEARNING ACTIVITY	Teacher demonstrates the concept of multiplication with the help of cards as it was done in the case of addition and subtraction. Guides children in doing multiplication of a monomial by another and a monomial by a binomial and so on using some exemplary illustrations using different patterns and dot sheets and conducts an activity involving hetrogeneous groups where each group is provided with sets of cards consisting of algebraic expressions and will be directed to perform multiplication using those cards and are advised to check the correctness with general multiplication. 	pupils are divided into hetrogeneous groups and engaged in the activity	Each student in the group participates in the activity and learns the concept
SUMMARY	Teacher once again writes important key words and summary of the concept 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 procedure
ASSESSMENT	Teacher gives some questions from Try These sections as well as sums from exercise 8.3 & 8.4 and examples as well and asks children to do those sums	Every group will do the sums by discussion among each other	Every individual solves the sums on their own

PRACTICE PERIODS: 5 TO 9	MULTIPLICATION OF ALGEBRAIC EXPRESSIONS: INTRODUCTION, MULTIPLYING A MONOMIAL BY A MONOMIAL, MULTIPLYING TWO MONOMIALS,MULTIPLYING THREE OR MORE MONOMIALS, MULTIPLYING A MONOMIAL BY A POLYNOMIAL, MULTIPLYING A MONOMIAL BY A BINOMIAL, MULTIPLYING A MONOMIAL BY A TRINOMIAL, MULTIPLYING A POLYNOMIAL BY A POLYNOMIAL, MULTIPLYING A BINOMIAL BY A BINOMIAL, MULTIPLYING A BINOMIAL BY A TRINOMIAL		
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 # Multiplication of Algebraic Expressions # Pattern # Identity	Whole class activity : one child comes to the board and reads the key words loudly	Every child comes to the board and reads the key words and notes them down in their note
SIMILAR LINES READING	Teacher performs some multiplications on the black board and asks children to do some more by observing similar lines 	Each group will read the similar lines and will frame one more by watching them	Every individual will watch the similar lines and will frame some more
SUMMARY/ SYNOPSIS	Teacher once again writes important key words and summary of the concepts covered and asks children to note down and adopt.	Pupil groups will read and adopt the procedure	Teacher focuses on every individual so that each one learns the concept in successive upcoming practice sessions
WRITING/ EDITING	Teacher gives some questions from Try These sections and guides them in doing some sums of examples and exercise 8.3 & 8.4 and teacher checks the writings of children	One group will check the writings of the other and vice versa	

TEACHING PERIOD : 8 to 9	WHAT IS AN IDENTITY?, STANDARD IDENTITIES, APPLYING IDENTITIES		
CONCEPTS/STEPS	TEACHER ACTIVITY (I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY (YOU DO)
KEY WORDS	Brain storming session invoving children with key words # Identities # Algebraic Identities	* Students read the key words and answer the	Every Pupil will read and write the key words in their note books
CONCEPTUAL UNDERSTANDING	Teacher explains what an identity mean? Futher explains why all equations cannot be identities with some illustrations depicting how all equations need not be true at all times. Teacher Finally pulls out a conclusion from the children themselves that those equations which are true for values of variables involved in them will be named after algebraic identities. Later solves some sums by applying the identities and will guide children in apprehending the procedure involved in it.	Hetrogeneous groups are created and are engaged in activities	Every child participates in the activity and understands the concept
LEARNING ACTIVITY	**Example 12** Using Identity (II), find (ii) $(4.9)^2$ $(4.9)^2$ $= (5 - 0.1)^2$ $(a - b)^2 = a^2 + b^2 - 2ab$ Putting $a = 5$ & $b = 0.1$ $= (5)^2 + (0.1)^2 - 2(5)(0.1)$ $= 25 + \left(\frac{1}{10}\right)^2 - \left(2 \times 5 \times \frac{1}{10}\right)$ $= 25 + \frac{1^2}{10^2} - \left(\frac{10}{10}\right)$	(i) We have, $103 \times 97 = (100 + 3)(100 - 3)$ $= (100)^2 - (3)^2 = 10000 - 9 = 9991$ (ii) We have, $103 \times 103 = (103)^2$ $= (100 + 3)^2 = (100)^2 + 2 \times 100 \times 3 + (3)^2$ $= 10000 + 600 + 9 = 10609$ (iii) We have, $(97)^2 = (100 - 3)^2$ $= (100)^2 - 2 \times 100 \times 3 + (3)^2$ $= 10000 - 600 + 9 = 9409$ (iv) We have, $185 \times 185 - 115 \times 115$ $= (185)^2 - (115)^2 = (185 + 115)(185 - 115)$ $300 \times 70 = 21000$ **Example 13** Using Identity (III), find (iii) 194 × 206 194 × 206 $= (200 - 6) \times (200 + 6)$ $(a - b)(a + b) = a^2 - b^2$ Putting $a = 200$ & $b = 6$ $= (200)^2 - (6)^2$ $= 40000 - 36$ $= 39964$	ALGEBRAIC IDENTITIES Identity I $(a + b)^2 = a^2 + 2ab + b^2$ Identity II $(a - b)^2 = a^2 - 2ab + b^2$ Identity III $a^2 - b^2 = (a + b)(a - b)$ Identity IV $(x + a)(x + b) = x^2 + (a + b) x + ab$	
SUMMARY	Teacher writes the summary of the concept discussed and asks children to read, 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 procedure
ASSESSMENT	Teacher gives some questions from Try These section and exercise sums of 8.5 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: 10 to 11	WHAT IS AN IDENTITY?, STANDARD IDENTITIES, APPLYING IDENTITIES		
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 # Identities # Algebraic Identities	Whole class activity : one child comes to the board and reads the key words loudly	Every child comes to the board and reads the key words and notes them down in their note
SIMILAR LINES READING	Teacher will solve some exemplary sums related to usage of identities in sums and asks children to solve some more by watching similar lines	Each group will read the similar lines and will solve some more by discussion	Every Individual prepares their own similar lines using the lines prepared by the teacher
	Example 14 Use the Identity $(x + a)(x + b) = x^2 + (a + b)x + ab$ to the following: (i) 501×502 501×502 $= (500 + 1) \times (500 + 2)$ $(x + a)(x + b) = x^2 + (a + b)x + ab$ Putting $x = 500$, $a = 1$ & $b = 2$ $= (500)^2 + (1 + 2)(500) + (1)(2)$ $= 250000 + (3 \times 500) + 2$ $= 250000 + 1500 + 2$ $= 251502$ $\Rightarrow 108 \times 108$ $\Rightarrow (108)^2$ $\Rightarrow (100 + 8)^2$ $using \ (x + y)^2 = x^2 + y^2 + 2xy,$ $\Rightarrow (100 + 8)^2 = (100)^2 + (8)^2 + 2 \times 100 \times 8$ $\Rightarrow 10000 + 64 + 1600$ $\Rightarrow 11664$ $(98)^2 = (100 - 2)^2$ $= (100)^2 + (2)^2 - 2 \times 100 \times 2$ $= 10000 + 4 - 400$ $= 9604$		
SUMMARY/ SYNOPSIS	Teacher once again writes important key words and summary and asks children to read ,note down and adopt.	Pupil groups will read the summary and utilize	Teacher focuses on every individual so that each one knows and adopts the concept learnt in successive upcoming practice sessions
WRITING/ EDITING	Teacher asks children to solve the sums of exercise 8.5 on their own and teacher checks the writings of children	One group will check the writings of the other and vice versa	