LESSON PLAN 2

CLASS : 9 SUBJECT : MATHEMATICS TEACHER'S NAME :

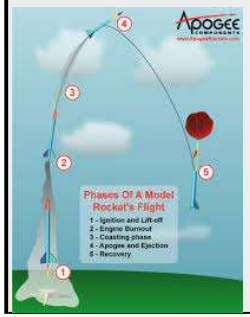
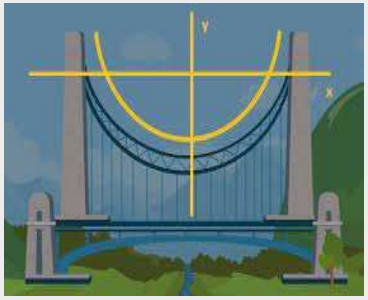
NAME OF THE UNIT	SUB-TOPICS		NO OF PERIODS REQUIRED			Time line for teaching	
			Teaching	Practice	TOTAL	From	To
POLYNOMIALS	2.1	INTRODUCTION	2	2	4		
	2.2	POLYNOMIALS IN ONE VARIABLE	2	3	5		
	2.3	ZEROS OF A POLYNOMIAL	2	3	5		
	2.4	FACOTRISATION OF POLYNOMIALS	2	3	5		
	2.5	ALGEBRAIC IDENTITIES	1	2	3		
		TOTAL	9	13	22		
PRE-REQUISITES & SKILLS	Every Pupil is expected to have basic knowledge and skills in # Different Number systems N.W,Z,Q,Q^{1}R # four basic operations like +,-,x and ÷ # Basic Knowledge on Term, Constant,Variable, Numerical Expression & Algebraic Expression # Basic info on exponents and powers # Preliminary knowledge about algebraic identities						

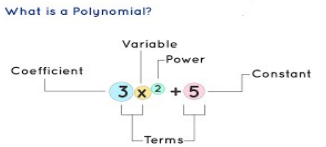
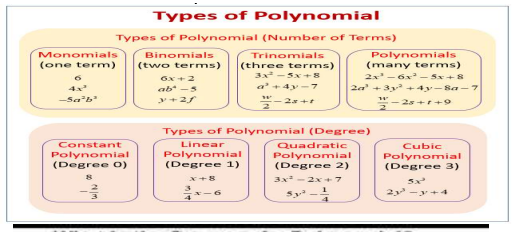
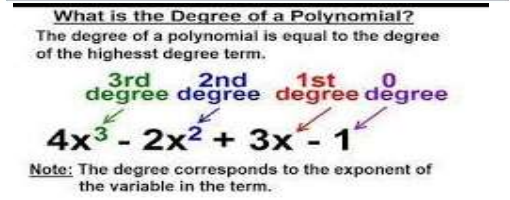
Learning Outcomes

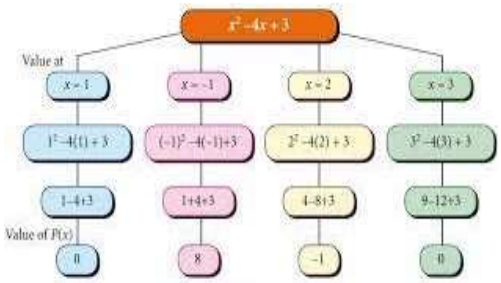
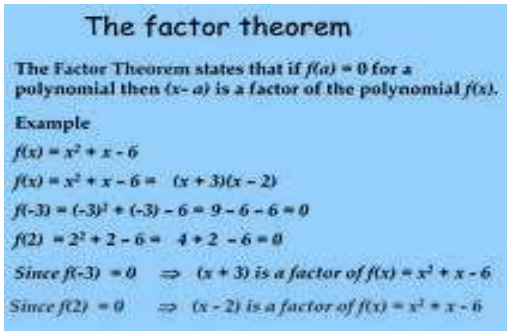
After Completion of this lesson every student will be able to

 # distinguish between a multinomial and polynomial and can separate polynomials out of the given algebraic expressions
 # find the coeffecient and degree of a polynomial
 # factorise given polynomial with factor theorem
 # find the remainder using remainder theorem
 # utilize the concept of polynomials in real life situations and appreciate its significanace

Teaching Learning Process

INTRODUCTION /INDUCTION	Experience & Reflection
Teacher introduces the chapter of Polynomials by citing some real life examples where we use Polynomials such as in constructing bridges, while throwing a ball into sky, the path of the ball, while launching a rocket, the path of the rocket travelled   	# Pupils will recollect their knowledge on concepts they are familiar with like numerical expression, algebraic expression and algebraic identities and utilize them in understanding about polynomials # Students will experience the usage of Polynomials and its related applications like factor theorem and remainder theorem in real life situations.

EXPLICIT TEACHING/TEACHER MODELLING (I DO)	GROUP WORK (WE DO)	INDEPENDENT WORK (YOU DO)	NOTES
1.1. INTRODUCTION Teacher recalls the pupils' knowledge on various things like 'Term' Constant, Variable, Numerical Expression, Algebraic Expression, Algebraic Identities and with the help of them introduces the concept of polynomials	Hetrogeneous groups will be formed and each group will be asked to cite one example for each under constant, variable, algebraic expression, numerical expression etc., and with the help of them teacher brings them into the concept of Polynomials by citing some real life situations where polynomials are used.	Every individual will participate in the activity by citing atleast one example each	Terms involving constants and variables with mathematical operations are called algebraic expressions
2.2 POLYNOMIALS IN ONE VARIABLE Teacher introduces the concept of polynomials by citing some real life situations where the necessity of polynomials arise and by the way he expresses what a polynomial is one variable is, a monomial, binomial, trinomial constant polynomial zero polynomial etc., along with the degree of a polynomial	Pupil groups will be given different algebraic expressions and are asked to saggregate the polynomials from them and further they are instructed to saggregate monomials, binomials, trinomials etc., simultaneously they are taught with what a linear polynomial is, what a quadratic polynomial is and what a cubic polynomial is By the way they will be introduced with what a degree of a polynomial mean and how to find it? Definition A polynomial function in the variable x with degree n is defined as $P(x) = a_n x^n + a_{n-1} x^{n-1} + a_{n-2} x^{n-2} + \cdots + a_2 x^2 + a_1 x + a_0$ Where Each $a_i \in R$, $a_n \neq 0$. And n Is A whole Number **Monomial**: a polynomial with exactly one term. ax^2, rt, $2x^4$, $-9m$, $9x^2y$ **Binomial**: a polynomial with exactly two terms. $x-8$, $r-3$, $5x^2+2x$, $-2x+9x^2y$ **Trinomial**: a polynomial with exactly three terms. x^2+x-8, r^5+3r-3, $5x^2+2x-7$	Students will solve example sums and sums of exercise 2.1 on their own under the guidance of teacher	 Types of Polynomials Linear $ax+b=0$ Quadratic $ax^2+bx+c=0$ Cubic $ax^3+bx^2+cx+d=0$  

EXPLICIT TEACHING/TEACHER MODELLING (I DO)	GROUP WORK (WE DO)	INDEPENDENT WORK (YOU DO)	NOTES
2.3 ZEROS OF A POLYNOMIAL Teacher demonstrates the procedure of finding zeros of a polynomial with some illustrations $p(x) = x^2-4x+3$ $p(1)= 1^2-4x1+3 = 0$ $p(3) = 3^2-4x3+3=0$ $p(2)= 2^2-4x2+3=-1$ here 1,2 are zeros of the polynomial and 2 is just a value of polynomial at 2	Children are engaged in finding the values of a polynomial by taking no.of examples under linear, quadratic and Cubic polynomials and will be demonstrated that for a polynomial p(x), the value of x at which p(x) becomes zero is called the zero of the polynomial  	Students will participate in the activity and will solve the example sums as well as sums of exercise 2.2 on their own under the guidance of teacher	$ax+b=0$ $ax=-b$ $\therefore x=\frac{-b}{a}$ $x=\frac{-b}{a}$ is zero of the polynomial $P(x)$
1.4 FACTORISATION OF POLYNOMIALS Teacher demonstrates the factor theorem with the help of some examples (by citing numerical division as well)	Students will participate in activity involving numerical division first and with the help of that teacher demonstrates various terms in the division format and introduces factor theorem  	Students will participate in the activity and will solve the example sums as well as sums of exercise 2.3 on their own under the guidance of teacher	Factor Theorem definition and examples

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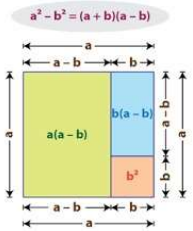
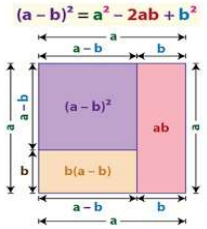
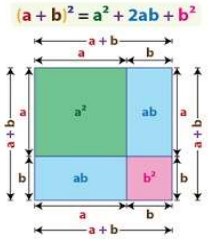
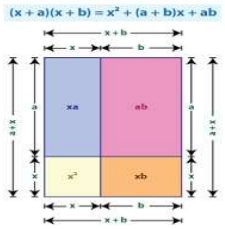
2.5 ALGEBRAIC IDENTITIES Teacher recalls the previous knowledge of children on algebraic identities and explains usage of those identites in solving algebraic as well as numeric sums and also guides in learning new identities.	An activity involving hetrogeneous groups is conducted in which teacher gives some algebraic identity based sums to each groups and asks children to identify which identity perfectly suits to solve those sums. Teacher also demonstrates some more identities and illustrates them with pictorial representation so as to make each child surely acquainted with the concept of algebraic identities.	Students will participate in the activity and will solve the example sums as well as sums of exercise 2.4 on their own under the guidance of teacher	Algebraic Identities ❖ $(a+b)^2 = a^2 + 2ab + b^2$ ❖ $a^2 + b^2 = (a+b)^2 - 2ab$ ❖ $(a-b)^2 = a^2 - 2ab + b^2$ ❖ $a^2 + b^2 = (a-b)^2 + 2ab$ ❖ $(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab+bc+ca)$ ❖ $(a+b)^3 = a^3 + b^3 + 3ab(a+b)$ ❖ $a^3 + b^3 = (a+b)^3 - 3ab(a+b)$ ❖ $(a-b)^3 = a^3 - b^3 - 3ab(a-b)$ ❖ $a^3 - b^3 = (a-b)^3 + 3ab(a-b)$ ❖ $a^2 - b^2 = (a+b)(a-b)$ ❖ $a^3 - b^3 = (a-b)(a^2+ab+b^2)$ ❖ $a^3 + b^3 = (a+b)(a^2-ab+b^2)$
			
CHECK FOR UNDERSTANDING QUESTIONS			
1. Factual	1) The degree of the polynomial $p(x)=2x^3-4x^2+8$ is ……. 2) A Polynomial consisting of three terms is named as …… 3) The remainder when the polynomial $p(x)=-2x^3-4x^2+8$ is divided with x-2 is		
2. Open Ended/Critical Thinking	1) The degree of a zero polynomial is …… 2. What will you find whether p(2) or p(-2) to find the remainder of $p(x)= x^2-3x+4$ when divided with (x+2)		
3.Student Practice questions & Activities	1.find the Value of 103^2 2. Find the zeros of the polynomial x^2-2x+1		
4. Assessment	1) Worksheet Polynomials		