MATHEMATICS TEACHING

B.Sc. (C.S.) VI – Semester
Session: 2018-19

Project Report Submitted to:

SRI SATHYA SAI
COLLEGE FOR WOMEN

Signature(Guide)
Dr. Shalu Saxena Ma'am

Signature (Student)
Needhi Dubey
Roll No. : 170160656

STUDENT'S DECLARATION LETTER

I ..NEEDHI.. DUBEY...... of class ...B.Sc. (C.S.) VI Sem
of ..SRI... SATHYA.. SAI.. COLLEGE.. FOR.. WOMEN.....
state that I have been present personally at the institution
.VIVEKANANDA.. VIDYAPEETH.. HR.. SEC.. SCHOOL
from the date ...17.-01.-19..... to .20.-02.-19.... & received internship
training from the institute & submitted report is prepared by me.

Signature

Name: .NEEDHI.. DUBEY

CERTIFICATE BY SUPERVISOR TEACHER

This is to certify that the present internship training whose title is .MATHEMATICS. TEACHING..... has been prepared under my guidance after getting training in VIVEKANANDA. VIDYAPEETH. HR. SEC........ Institution by .NEEDHI. DUBEY..... of class ...B.Sc. (C.S.) II - Sem

Seal and Signature

Supervisor's name: POONAM BHARDWAJ

CERTIFICATE BY INSTITUTION

This is to certify that ..NEEDHI..DUBEY.....
has received internship training from the date 17.-01-19.......... to
20.-02.-19..... from ..VIVEKANANDA..VIDYAPEETH..HR.SEC. SCHOOL

Principal
Vivekananda Vidyapeeth
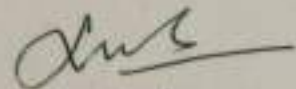C-Sector, Piplani, BHEL, Bhopal

(Seal & Signature)
Head of institution

Name of institution: ...VIVEKANANDA...VIDYAPEETH. HR. SEC. SCHOOL

INTERNSHIP TRAINING FORMAT

MONTHLY PROGRESS REPORT

1. Student's name — NEEDHI DUBEY
2. Class — B.Sc. (C.S.) VI - Sem
3. Father's name — Mr. K.P. DUBEY
4. Name of college — SRI SATHYA SAI COLLEGE FOR WOMEN
5. Address & Contact no. — B-34 CRYSTAL CAMPUS NEAR AWADHPURI, KHAJURI KALAN, B.H.E.L., BHOPAL
6. Supervisor's name — POONAM BHARDWAJ
7. Name/Address & Telephone no. of the Training institute — VIVEKANANDA VIDYAPEETH HR. SEC SCHOOL "C" SECTOR PIPLANI, B.H.E.L. BHOPAL CONTACT No.: 0755 - 2621944

8. Assessment regarding the student by the representative/institution head prescribed by the institution

(i) Punctuality — 100%

(ii) Costume & Behavior — Excellent

(iii) Following the rules of the institute — V. Good

(iv) Fidelity towards the work assigned — Excellent

(v) Communication skills — V. Good

(vi) What kind of improvement is required in personality, the progress efforts made for this — Able to perform much better in the future.

(vii) Learning ability towards the work assigned — V. Good

Principal
Vivekananda Vidyapeeth
C-Sector, Piplani, BHEL, Bhopal
(Seal & Signature)
Head of institution

Acknowledgment

A journey is easier when you travel together. Interdependence is certainly more valuable than independence. This project report is the result of training whereby I have been accompanied and supported by many people. So, I would like to take this opportunity to express my deep sense of gratitude to all those people without whom this project could have never been completed.

Firstly and foremost, all praises is for **God** who guided me, showed me the way to overcome all the obstacles appeared throughout this training.

I would like to express a sincere gratitude towards our Principal **Dr. (Smt.) Sudha Pathak** for her constant moral support, giving permission to do my internship and providing a very nice platform to learn.

I am extremely thankful to my internship guide **Dr. (Smt) Shalu Saxena, Dr. Smita Nair** and whole Mathematics department for their continuous constructive guidance and invaluable knowledge during this internship. Their guidance and supervision was very helpful in bringing this work to conclusion. They are my inspiration to keep me strong and never give up while facing any obstacles that appear before success.

My deep appreciation goes to my beloved parents for their support and kind help from the beginning until the end.

A great thanks and my special gratitude towards the Principal Sir **Swami Krishnadhyananda ji** and incharge **Poonam Bhardwaj Ma'am** of **Vivekananda Vidyapeeth** institute for giving me such attention, time and their kind supervision. Without their help, permission and co-operation; I could have never finished my training successfully.

I would also like to express my deepest gratitude to those who are directly or indirectly involved throughout this training. I realized that in this process of gaining knowledge, I cannot stand on my own without these people mentioned above because in every success of a person, there are always those people who stand behind them for providing every needed support.

"Thank You"

Needhi Dubey

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1. Title of the project

2. Object behind choosing the stream/curriculum

3. Employment and self-employment opportunities in the stream/curriculum chosen

4. From where did I get inspiration for the option chosen

5. Minimum qualification required for the option chosen
   (a) Education
   (b) Technical
   (c) Experience

6. Indirect skills are required for the option chosen

7. Efforts taken for developing indirect skills

8. Problems faced during internship

9. Experience of internship

10. Benefits expected from internship in future.

Daily Work

Class: 6th and 7th

S.No.	Date	Work done during the day	Signature of incharge
1.	17-01-19	Introduction of subject and discussion about basic topics.	
2.	18-01-19	Basic information about number system like, natural number, whole number, prime, co-prime, even/odd, etc.	
3.	21-01-19	Fractional no., like and unlike fractions, numerator/denominator, proper & improper fractions.	
4.	22-01-19	Office Work	Bhavna
5.	23-01-19	Decimals, conversion of decimals into fractions	
6.	29-01-19	Test on fractional & decimal no. topic.	

Daily Work

Class: 8*

S.No.	Date	Work done during the day	Signature of incharge
1.	28-01-19	Introduction: Algebraic Expressions and Identities with example questions	
2.	30-01-19	Excercise : 9.1 and 9.2 with examples	
3.	31-01-19	Exercise: 9.3 with examples	
4.	01-02-19	Exercise: 9.4 with examples	
5.	02-02-19	Explanation and some questions on 1st and 2nd identities. i.e, $(a+b)^2 = a^2 + 2ab + b^2$ $(a-b)^2 = a^2 - 2ab + b^2$	
6.	04-02-19	Questions on 3rd and 4th identities i.e, $(a^2-b^2) = (a-b)(a+b)$ $(x+a)(x+b) = x^2 + x(a+b) + b^2 ab$	
7.	05-02-19	Exercise : 9.5 with examples	
8.	06-02-19	Doubt class	
9.	07-02-19	Class Test	
10.	08-02-19	Discussion about the general mistake and declaration of result	
11.	09-02-19	Introduction: Factorization and some definitions	
12.	12-02-19	Factorization when a binomial is common and factorization by grouping: example + exercise questions	

Daily Work

Class: 8th

S.No.	Date	Work done during the day	Signature of incharge
13.	13-02-19	Factorization when a common monomial factor occur in each term : example + exercise questions	
14	14-02-19	Exercise : 7.1 with examples	
15.	15-02-19	Factorization using identities	
16.	16-02-19	Exercise : 7.2 and 7.3	
17.	18-02-19	Middle term spilliting	
18.	19-02-19	Exercise : 7.4	
19.	20-02-19	class Test	

Daily Work
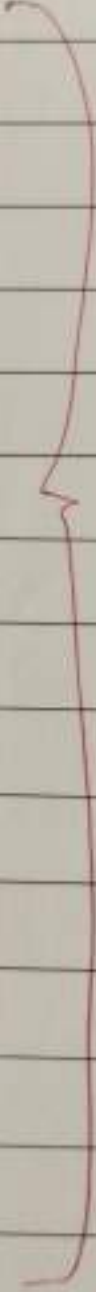
Class: 10th

S.No.	Date	Work done during the day	Signature of incharge
1.	19-01-19	Introduction: Linear Equation in two Variables	
2.	24-01-19	Exercise : 3.3 Substitution method and example questions	
3.	25-01-19	Exercise : 3.4 Elimination method and example questions	Bhuichu
4.	26-01-19	Republic Day Celebration	
5.	27-01-19	Swami Vivekananda Jithi Puja.	

Attendance Sheet

S. No.	Date	Class: 6th and 7th Total Strength: 18		Signature of incharge
		Present	Absent	
1.	17-01-19	10	08	
2.	18-01-19	15	03	
3.	21-01-19	17	01	
4.	22-01-19	—	—	
5.	23-01-19	16	02	
6.	29-01-19	18	00	

Attendance Sheet

S. No.	Date	Class: 8th Total Strength: 32		Signature of incharge
		Present	Absent	
1.	28 – 01 –19	30	02	
2.	30 – 01 –19	30	02	
3.	31 – 01 –19	30	02	
4.	01 – 02 –19	29	03	
5.	02 – 02 –19	29	03	
6.	04 – 02 –19	31	01	
7.	05 – 02 –19	30	02	
8.	06 – 02 –19	28	04	
9.	07 – 02 –19	32	00	
10.	08 – 02 –19	32	00	
11.	09 – 02 –19	20	12	
12.	12 – 02 –19	27	05	
13.	13 – 02 –19	24	08	
14.	14 – 02 –19	22	10	
15.	15 – 02 –19	23	09	
16.	16 – 02 –19	25	07	

Attendance Sheet

| S. No. | Date | Class: 8th Total Strength: 32 | | Signature of incharge |
		Present	Absent	
17.	18-02-19	31	01	
18.	19-02-19	29	03	Bhardwaj
19.	20-02-19	32	00	

Attendance Sheet

S. No.	Date	Class: 10th Total Strength: 12		Signature of incharge
		Present	Absent	
1.	19-01-19	11	01	
2.	24-01-19	12	00	
3.	25-01-19	10	02	Bhardwaj
4.	26-01-19	—	—	
5.	27-01-19	—	—	

Lesson Plan

Class: 6th & 7th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
1.	Fractions	Do you all had learnt about fractions in your previous classes?	Yes Ma'am
		Tell me something about fractions that you know...	Ma'am it is written in the form of numerator & denominator.
		OK! But here is the proper definition of fraction, "A fraction is a number representing part of a whole."	
		Yes ofcourse! it is represented in the form of numerator and denominator.	OK Ma'am
		Let's take an example,	
		Here; $\frac{4}{8}$, we divide a whole into eight equal parts and take four parts out of it.	Got it.

Lesson Plan

S.No.	Teaching Point	Teacher's Activity	Student's Activity
		Now, tell me one thing, How many types of fractions are there? Name them?	4 types
			Proper, Improper, Mixed & equivalent fractions
		Exactly! What are the difference between them?	They confused.
		Okay, No problem, let us try to understand.	
		FRACTIONS	
		Proper fraction Improper fraction Mixed Fraction Equivalent Fraction	
		<u>PROPER FRACTIONS</u>:- In a proper fraction the numerator is always less than the denominator. For example, $\frac{3}{4}$, $\frac{1}{2}$, $\frac{9}{10}$, $\frac{5}{8}$, etc.	yes Ma'am
		Does any one of the fraction lie beyond 1?	No reaction
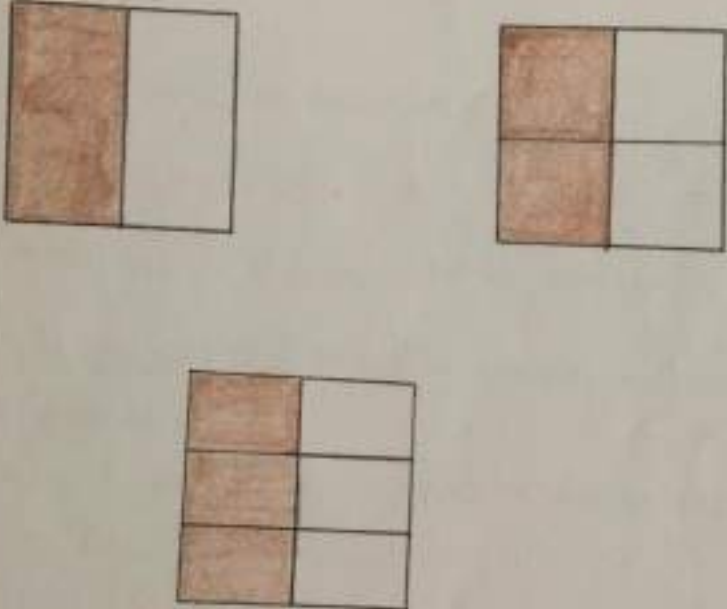
Lesson Plan

Class: 6th & 7th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
		All these fractions lie to the left on 1 as they are less than 1.	Ok Ma'am
		IMPROPER FRACTIONS:– The fractions where the numerator is bigger than the denominator are called improper fractions. For ex, $\frac{3}{2}$, $\frac{12}{7}$, $\frac{8}{5}$, etc.	yes Ma'am
		MIXED FRACTIONS:– A mixed fraction has a combination of whole & a part. Ex, $1\frac{1}{4}$, $2\frac{1}{2}$, etc. This is 1 full triangle This is $2\frac{1}{2}$ triangles How many shaded halves are there in $2\frac{1}{2}$?	Ok Ma'am 5 shaded halves

Lesson Plan

Class: 6th & 7th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
		So, the fraction can be written as $2\frac{1}{2}$ or $\frac{5}{2}$.	OK Ma'am
		<u>EQUIVALENT FRACTION</u>:- Look at these representation of fractions These fractions are $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{6}$ representing the parts taken from the total no. of parts.	students follow.

Lesson Plan

Class: 8th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
2.	Algebraic Expression	Do you all have any idea about expressions, terms, factors & co-efficients?	Ma'am there is confusion in all these aspects.
		Okay! Today we will clear all these topics.	
		Let's take an example:	
		$$3xy + 2x + 4$$	
		Here, we will clear some concepts.	OK Ma'am
		VARIABLES:— A quantity whose value changes.	
		Here, in the above example variables are:	
		x & y.	OK Ma'am
		CONSTANTS:— A quantity whose value never changes.	
			Yes Ma'am
		Ex, 4	
		TERMS:— Terms are added to form expressions.	
		Here,	
		$3xy$, $2x$ & 4	OK Ma'am

Lesson Plan

S.No.	Teaching Point	Teacher's Activity	Student's Activity
		FACTORS:— Terms themselves are formed as the product of factors. Here, $3xy$ (term) → $3 \quad x \quad y$ (Factors) $2x$ (term) → $2 \quad x$ (Factors) 4 (term) → $4 \quad 1$ (Factors) **CO-EFFICIENT:**— Numeric factors. Here, $3xy$ is a term xy is a variable & number is 3 So, in $3xy$ the co-efficient is 3 & in $2x \Rightarrow 2$ is co-efficient. When all these aspects are combine; they form an expression or we can say combination of terms. Ex., $2y-5, \quad x+3, \quad 3x^2+4x+7,$ et. How many types of expressions are there?	Students follow Got it May be 3 or 4

Lesson Plan

Class: 8th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
		It is of 4 types: Algebraic Expressions — Monomial, Binomial, Trinomial, Polynomial Why not... **MONOMIAL:**- Expression that contain only one term. Correct! **BINOMIAL:**- Expression that contain two terms. Absolutely! **TRINOMIAL:**- Expression that contain three terms. Well done! **POLYNOMIAL:**- A polynomial may contain any number of terms, one or more than one.	Yes Ma'am Ma'am please explain these topics in detail. Ex., $2x, 4x^2$, etc. $3x^2 + 2y$, $a+b$, etc. $2x+3y+5z$, $a+b+c$, etc. Why ma'am?

Lesson Plan

Class: 8th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
		All the monomial, binomial and trinomial come under polynomial.	
		There is no restriction that a polynomial contain more than three terms.	OK Ma'am
		Ex.,	
		$a+b$, $3x^2$, $2y+4z$, $l+2m+5n$, $2x+3y+7z+5$, etc.	Got it.

Lesson Plan

Class: 8th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
3.	Identity	What is an identity? "An identity is an equality, which is true for all values of the variables." For ex., Consider an equality: $(a+1)(a+2) = a^2 + 3a + 2$ L.H.S. Let's take an value of a say $a = 10$ $(a+1)(a+2)$ $\Rightarrow (10+1)(10+2)$ $\Rightarrow 11 \times 12$ $\Rightarrow 132$ R.H.S. $\qquad a^2 + 3a + 2$ $\Rightarrow (10)^2 + 3(10) + 2$ $\Rightarrow 100 + 30 + 2$ $\Rightarrow 132$ $\therefore$ L.H.S. = R.H.S. Thus, the values of the two sides of the equality are equal for $a=10$. Now, let's take another value, say $a = -5$	Yes Ma'am Yes Ma'am Yes Ma'am

Lesson Plan

Class: 8th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
		<u>L.H.S.</u> $(a+1)(a+2)$ $\Rightarrow (-5+1)(-5+2)$ $\Rightarrow (-4)\times(-3)$ $\Rightarrow 12$ <u>R.H.S.</u> a^2+3a+2 $\Rightarrow (-5)^2+3(-5)+2$ $\Rightarrow 25-15+2$ $\Rightarrow 10+2$ $\Rightarrow 12$ Thus for $a=-5$ $\quad$ L.H.S. $=$ R.H.S. We shall find that for any value of a, L.H.S. $=$ R.H.S. Thus, $(a+1)(a+2)=a^2+3a+2$ is an identity. The following three identities are very important. <u>Identity 1</u> :- $(a+b)^2=a^2+2ab+b^2$ Let's prove this identity,	OK Ma'am yes Ma'am

Lesson Plan

S.No.	Teaching Point	Teacher's Activity	Student's Activity
		Proof:- $(a+b)^2 = (a+b)(a+b)$ $= a(a+b) + b(a+b)$ $= a^2 + ab + ba + b^2$ $= a^2 + 2ab + b^2 \quad [\because ba = ab]$ $\therefore (a+b)^2 = a^2 + 2ab + b^2.$	Got it
		Identity 2 :- $(a-b)^2 = a^2 - 2ab + b^2$ Proof:- $(a-b)^2 = (a-b)(a-b)$ $= a(a-b) - b(a-b)$ $= a^2 - ab - ba + b^2$ $= a^2 - 2ab + b^2 \quad [\because ba = ab]$ $\therefore (a-b)^2 = a^2 - 2ab + b^2$	students follow
		Identity 3 :- $(a-b)(a+b) = (a^2 - b^2)$ Proof:- $(a-b)(a+b) = a(a+b) - b(a+b)$ $= a^2 + ab - ba - b^2$ $= a^2 - b^2$ $\therefore (a+b)(a-b) = a^2 - b^2.$	OK Ma'am

Lesson Plan

Class: 8th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
4.	Factorization	As we learnt in previous topic about factors.... What is factors? Yes, Correct! But, now here we will discuss about some more concepts of factors. So, When an algebraic expression can be written as the product of two or more expressions then each of these expressions is called factors of the given expression. These factors may be numbers, algebraic variables or algebraic expressions. Ex., $3xy$, $5x^2y^2z$, $2x(y+z)$, $5(y+1)(x+2)$ Now we have to learn in this topic is about factorization. The process of finding two or more expressions whose product is the given expression is called factorization. As factorization is the reverse process of multiplication? Okay!	Product of terms. OK Ma'am yes Ma'am Students follow. OK Ma'am yes Ma'am

Lesson Plan

Class: 8th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
		There were numbers of methods to find factors of the given expression.	OK Ma'am
		Let's check out some methods:	
		1. **Method of common factors** :-	
		We begin with a simple example,	OK Ma'am
		$$2x + 4$$	
		We can write in the form of term as,	
		$2x = 2 \times x$	
		$4 = 2 \times 2$	
		Hence,	
		$2x + 4 = (2 \times x) + (2 \times 2)$	
		Notice!	Students follow
		That factor 2 is common to both the terms.	
		Take it out,	
		$(2x + 4) = (2 \times x) + (2 \times 2)$	
		$\boxed{(2x + 4) = 2(x + 2)}$	
		This is required factor.	OK Ma'am

Lesson Plan

Class: 8th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
		2. <u>Factorization by regrouping terms</u>: Look at the expression,	
		$$2xy + 2y + 3x + 3$$	
		Is there any common factor in the whole expression?	No Ma'am, There is no common factor.
		See, you will notice that first two terms i.e., $2xy$ & $2y$ have common factor 2 & y and the last two terms i.e., $3x+3$ have common factor 3.	Yes Ma'am
		But there is no single factor common to all the term.	
		How shall we proceed? Let us write $(2xy+2y)$ in the factor form:	Don't know Ma'am
		$$\begin{aligned} 2xy + 2y &= (2 \times x \times y) + (2 \times y) \\ &= (2 \times y \times x) + (2 \times y \times 1) \\ &= (2y \times x) + (2y \times 1) \\ &= (2y(x+1) \end{aligned}$$	

Lesson Plan

Class: 8th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
		Similarly, $$3x+3 = (3 \times x) + (3 \times 1)$$ $$= 3 \times (x+1)$$ $$= 3(x+1)$$ Hence, $$2xy + 2y + 3x + 3 = 2y(x+1) + 3(x+1)$$ You observe; Now we have a common factor $(x+1)$ in both the terms. What we have to do? Correct! So, $$2xy + 2y + 3x + 3 = 2y(x+1) + 3(x+1)$$ $$\boxed{2xy + 2y + 3x + 3 = (2y+3)(x+1)}$$ This is required factor. Similarly, we have so many methods for factorization. Some more methods are: (a.) Using regrouping :— $\hookrightarrow a^2 + bc + ab + ac$ $\hookrightarrow a^2 + ab + ac + bc$ $\hookrightarrow a(a+b) + c(a+b)$ $\hookrightarrow (a+c)(a+b)$	Take out as a common factor. OK Ma'am OK Ma'am

Lesson Plan

Class: 8th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
		(b) Factorization using identities :— $\rightarrow (a^2 - b^2) = (a+b)(a-b)$ $\rightarrow (a^2 - b^2)^2 = a^2 + b^2 - 2ab$ $\rightarrow (a+b)^2 = a^2 + b^2 + 2ab$ (c) Factorization of quadratic polynomial :— Ex, $\boxed{x^2 + px + q}$ $x^2 + 8x + 15 = x^2 + 5x + 3x + 15$ $\qquad\qquad = x(x+5) + 3(x+5)$ $\qquad\qquad = (x+3)(x+5)$ It is also called 'Middle Term Spilliting' method.	Students follow Yes Ma'am OK Ma'am

Lesson Plan

Class: 10th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
5.	Linear Equation in two Variables	The name of our topic is linear equation. My first question is what is linear equation.	An eqn whose degree is 1.
		Correct!	
		Now here we have to learn equation in two variables.	
		Can anyone tell me what is the form of this equation; as you all already studied in 9th standard.	Yes ma'am. it is in the form of $ax + by + c = 0$.
		Well done!	
		Where a, b and c are?	real numbers
		very good.	
		We often denote the condition a & b are not equal to zero $(a + b \neq 0)$	Yes ma'am
		You have also studied that a solution of such an equation is a pair of values.	
		One for x and the other for y, which makes the two sides of the equation equal.	Yes ma'am we studied.
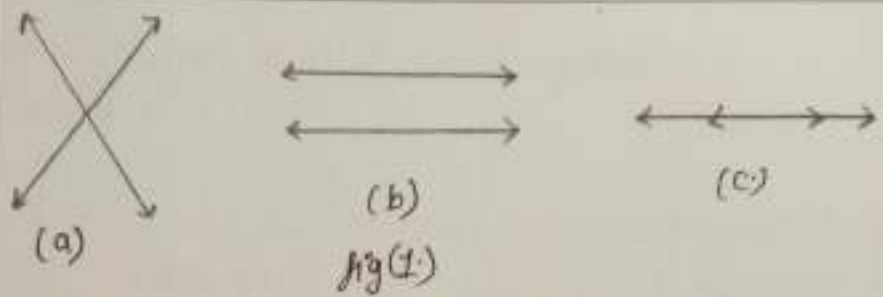
Lesson Plan

Class: 10th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
		For ex., $$2x + 3y = 5$$ Let us substitute $x=1$ & $y=1$ in L.H.S. L.H.S. $$2x + 3y$$ $$\Rightarrow 2(1) + 3(1)$$ $$\Rightarrow 2 + 3$$ $$\Rightarrow 5$$ which is equal to the R.H.S. $\therefore x=1$ & $y=1$ is the solution of the equation $2x+3y=5$.	students follow OK Ma'am
		In your previous classes, you have studied that given two lines in a plane, only one of the following three possibilities can happen:	Yes Ma'am
		i) The two lines will intersect at one point. ii) The two lines will not intersect i.e., they are parallel. iii) The two lines will be coincident. I will show you these three possibilities by figure representation.	OK Ma'am

Lesson Plan

Class: 10th

S.No.	Teaching Point	Teacher's Activity	Student's Activity
		(a) (b) (c) fig(1) In fig. 1(a), They intersect In fig. 1(b), They are parallel In fig. 1(c), They are coincident. Methods for Solving Linear Equations :- 1. Graphical method 2. Substitution method 3. Elimination method 4. Cross-Multiplication method	yes Ma'am OK Ma'am, Got it.

1. Title of project work.

The title of my project is **"MATHEMATICS TEACHING"**.

2. What is your object behind choosing the stream/curriculum?

Creation of nature and Mathematics are closely related. The sun, moon, earth, other planets and stars are specific geometrical figures. Thus, the origin of Mathematics is hidden in the evolution of nature. On the other hand the natural curiosity of human being might be considered as the source of origin of Mathematics. Human is the most intelligent creature of the universe. In all the spheres of life activities, he makes use of his mind. So, obviously, at the first stage of his mental development some questions such as what, why, how and how many might have arisen by seeing the environment and sky, hearing the sound, etc. The questions how many and how much were concerned with measurement. To get the solution of these questions the primitive human would have to make an approach of logical reasoning and rational thinking which are the bases of Mathematics. It clearly indicates that mathematical phenomena prevailed in human beings from very beginning.

In the universe hardly we can search anybody who is beyond the use of Mathematics in his day-to-day life. There is a definite need of Mathematics in everybody's lifelong planning and day-to-day planning. Even the most ordinary citizen has to use the mathematical calculations when he buys the things from the market, exchanges a thing from another thing or from money, collects his wages, returns the loans, etc. It means that

some knowledge of Mathematics is absolutely essential to everybody whether he or she is a laborer, farmer, housewife, artisan, shopkeeper, vendor, salesman, driver, etc.

Thus, every sphere of human life is related to Mathematics.

Due to the following reason I choose this stream/curriculum:

> **Mathematics is an Exact Science**: Mathematics provides exact interpretation to the things to be studied. Its conclusions are always clear, precise and exact. Here answers of each and every question are judged by yes or no. There is no gap for discussion between yes and no.

For example,

The addition of two and two is always four $(2+2=4)$. If anybody answers other than four, it is out rightly rejected saying no or wrong.

Similarly, perpendicular line always makes a $90°$ angle with its base. It will not be termed as perpendicular of its line makes angle of any other degree with its base.

> **Mathematics Induces Logical Thinking**: In mathematical deposition every step has its rationale and thus the chain of steps leading to a conclusion or solution is logical. Here a term is linked with another term on logical basis.

For example,

$$(a + a) = 2a \text{ is based on the logic } (1 + 1 = 2).$$

> **It provides a Definite way of Thinking:** The logical thinking leads in an order of truth or facts. Therefore, during the process of solving mathematical problem students apply logic in a definite sequence of truth. At each step of this process student of Mathematics weighs his views on the balance of logic with the aid of weight of truth. Thus, it provides a definite way of thinking.

> **Mathematics is the basis of all Sciences:** Modern age is the age of science and technology. The development of science and technology is based on the progress of Mathematics. The basis of all the branches of Science viz., Physics, Chemistry, Astronomy, Astrology, Computer Science, Biology, Geology, etc., is Mathematics.

Without the use of Mathematics the development of Science is not possible. The advancement of knowledge in art, music, economics, psychology, social science and literature depend on the use of Mathematics. Thus, the knowledge of Mathematics is indispensable for the study of all other subjects.

> **It is related to every aspects of human life :** From very beginning, food, clothes and shelter are considered three basic needs of man. To fulfill these needs a person involves

himself in various activities and occupations. Some vocations are directly linked with Mathematics;

For example,

Engineering, Accountancy, etc.

and

some are also linked indirectly;

For example,

Tailoring, Carpentry, etc.

Without knowledge of Mathematics nobody can be successful in his life. Every step of success depends on the use of Mathematics.

3. What are the Employment and Self-employment opportunities in the stream/curriculum chosen?

Studying Mathematics helps you develop skills in logical thinking, problem solving and decision making, which are valued by employers across many job sectors.

1. Employment opportunities in the stream chosen

(a) *Jobs directly related to the bachelor's of Mathematics*

- **CHARTERED ACCOUNTANT:** Chartered accountants work in all fields of business and finance, including audit, taxation, financial and general management. Some are engaged in public practice work, others work in the private sector and some are employed by government bodies.

  Qualification - 10+2 in field of Commerce & bachelor's degree in Mathematics.
  Salary - ₹7,36,000 to ₹24, 64,000

- **RESEARCH SCIENTIST (MATHEMATICS):** The work of research Mathematician is varied but often involves proving deep and abstract theorems, developing mathematical descriptions to explain or predict real phenomena and applying mathematical principles to identify trends in data sets.

  Qualification - Bachelor's degree in Mathematics.

Salary - ₹5,99,152 per year

- **DATA SCIENTIST**: Data scientists are big data wranglers. They take an enormous mass of messy data points (unstructured and structured) and use their formidable skills in math, statistics and programming to clean, massage and organize them. Then they apply all their analytic powers- industry knowledge, contextual understanding, and skepticism of existing assumptions – to uncover hidden solutions to business challenges.

  Qualification - Bachelor's in Mathematics, Statistics, Computer Science
  Salary - ₹6,20,244 per year

- **ACTURIAL ANALYST**: **Actuarial Analysts** who work in the insurance industry use statistical models to analyze data calculate the probability of and costs associated with certain events, such as product failure, accidents, property damage, injury and death. They use the results to design and price insurance policies.

  Qualification - Bachelor's of Mathematics/Statistics
  Salary - ₹5,06,122 per year

- **SECONDARY SCHOOL TEACHER**: A career as a secondary school teacher offers you the chance to teach a subject you love and to engage pupils in learning for their future. Secondary school teachers support, observe and record the progress of pupils aged 11 to 18.

<u>Qualification</u> – Graduate with a **B.Ed.** degree
<u>Salary</u> – ₹3,01,462 per year

- **STATISTICIAN:** As a statistician, one will design and manage experiments and surveys and deal with the initial collection of data. You'll process and analyze the data in context, looking for patterns to help make decisions. You will then advise on findings and recommend strategy.

  <u>Qualification</u> - Graduate in Mathematics or Statistics
  <u>Salary</u> – ₹3,68,671 per year

(b) _Jobs where the degree can be useful include_

- **FINANCIAL MANAGER:** Financial managers are responsible for the financial health of an organization. They produce financial reports, direct investment activities and develop strategies and plans for the long term financial goals of their organization. Financial managers work in many places, including banks and insurance companies.

  <u>Qualification</u> - Graduates in Mathematics, Statistics, Economics, Accountancy, Business, etc.
  <u>Salary</u> – ₹9,56,578 per year

- **METEOROLOGIST:** Meteorologist use science and math to understand and predict weather and climate. They also

study how the atmospheric and weather conditions affect the earth and its human inhabitants.

Qualification - Graduate in Mathematics, Computer Science, Physics, etc.
Salary - ₹25,000 per month

- **SOFTWARE TESTER**: Software testers are employed to find bugs and issues within a product before it gets deployed to everyday users. You might work on bespoke, individual projects or multinational projects spanning the globe and costing billions of pounds. You will need to be, or become, familiar with programming and using coding languages.

  Qualification - Graduate in Mathematics, Physics, Chemistry or Electrical Engineering
  Salary - ₹3,30,857 per year

- **OPERATIONAL RESEARCH**: Operations research or operational research in British usage, is a discipline that deals with the application of advanced analytical methods to help make better decisions.

  Qualification - Graduates in Mathematics, Statistics, Economics, Engineering, Business Studies, etc.
  Salary - ₹3,11,486 per year

- **QUANTITY SURVEYOR**: A quantity surveyor manages all costs relating to building and civil engineering projects, from the initial calculations to the final figures. They seek

to minimize the costs of a project and enhance value for money, while still achieving statutory building regulations are met.

Qualification - Graduates in Mathematics, Statistics, Civil Engineering, Structural Engineering, etc.

Salary - ₹3,66,266 per year

2. Self - Employment opportunities in the stream chosen

- **COACHING:** Coaching is a process that enables learning and development to occur and thus performance to improve. To be a successful a Coach requires a knowledge and understanding of process as well as variety of styles, skills and techniques that are appropriate to the context in which the coaching takes place.

  Salary - ₹6,01,632 to ₹2,00,00,000 per year

- **TUITION:** Teaching, especially when given to a small group or one person.

  Salary - ₹20,000 to ₹75,000 per month

- **HOME TUTOR:** Private tutors provide one-on-one educational assistance to elementary and secondary school students or to adults. As an elementary school tutor, you may help children (grades 1-8) improve their skills in reading, writing or math.

  Salary ₹ 2,91,632 per year

- **ONLINE TUTORIAL:** An online tutorial is a self study activity designed to teach specific learning outcome. They are usually delivered via Blackboard but can also be made available via the internet or on a DVD.

Salary - ₹20,000 to ₹75,000 per month

Qualification - Tutors of a specific academic subject will normally have a background or qualification in that area, usually to degree level or equivalent. It is not compulsory to have a degree.
(The qualification given is for all the 4 self-employment options above)

4. From where did you get the inspiration for the option choosed?

> *"We are only collecting the small stones lying on the bank of sea; huge amount of water is still remaining to search from inside".*

These motivating lines given by **Sir Issac Newton** have been a source of great inspiration and driving force for me.

I come from a family of teachers. My father, uncle, aunt, my cousin brother, sister and other members are teachers of different subjects.

I learn so many best lessons in my life; from my parents.

My first inspiration is my *FATHER*. I like his teaching style, his attitude and dedication towards his students that inspires me to become a teacher like him.

He always says, **"Students are my teacher, if they don't understand something, it means that I have to learn it in a different way and find other ways to teach it"**.

This is the best lesson that I got from my *FATHER*.

This is a real fact that no person is perfect in this world. There are some good qualities in everyone. So, we have to move forward by adopting their goodness.

Unforgettable teachers inspires in many ways. There were so many teachers in my school life, who inspire me a lot.

Actually,

The dream of becoming a teacher has since been seen but to bring that dream into reality I got it from college while pursuing my under graduation.

As I say, unforgettable teachers inspire in many ways. They can make an average student an overachiever. They can make an average student push beyond the limitations and attain the highest expectations. Perhaps, one of the greatest achievement a teacher can get is inspire someone in the next generation to become a teacher.

All these things I get from my Mathematics teachers **Dr. Smita Nair Ma'am** and **Dr. Shalu Saxena Ma'am** of my college. They both are inspiration for me. The biggest reason for opting Mathematics as my teaching option is only due to their guidance.

Teaching is not just about to teach something but it's about caring, understanding, motivating, nurturing, helpful nature and many more towards the students and it also gives you chance to inspire many people. The field of teaching brings several challenges everyday and in the end teaches something new.

5. Minimum qualification required for the option choosed?

- **EDUCATIONAL:** Minimum educational in teaching varies from classes to classes. It is different for primary, secondary, higher secondary and for college.

  - **Primary:** Primary school teachers must be qualified to teach the range of primary school subjects to children aged 4 to 12 years. To qualify as a primary school teacher.
    Qualification – Senior secondary (or its equivalent) with at least 50% marks.

  - **Secondary:** Secondary education teachers work in high schools, where they teach students a particular subject area, such as history, English, Science or mathematics.
    Qualification – Graduation with at least 50% marks.

  - **Higher Secondary:** Higher secondary education teacher works in high school for 11th and 12th
    Qualification – Master's degree in the relevant subject.

- **TECHNICAL:** Minimum technical qualification required varies from class to class.

  - **Primary:** Passed or appearing in final year of 2-year Diploma in Elementary Education.

  - **Secondary:** Passed or appearing in 1-year Bachelor in Education (B.Ed.)

  - **Higher- Secondary:** Bachelor of Education (B.Ed.) or its equivalent.

- **EXPERIENCE:** Experience required varies from class to class and school to school.

CLASS	PRIVATE SCHOOL	GOVERNMENT SCHOOL
PRIMARY	atleast 1-2 years	Grade -3 Samvida Exam
SECONDARY	atleast 2-3 years	Grade -2 Samvida Exam
HIGHER-SECONDARY	atleast 3-4 years	Grade -1 Samvida Exam

6. What indirect skills are required for the option choosed?

The teachers play a vital role in imparting knowledge to the learners. The teaching skills are defined as a group of teaching acts or behaviors intended to facilitate students learning directly or indirectly.

❖ **Hard working**: Teaching is a demanding profession and to be an ideal teacher is a challenge that required hard work and numerous efforts. Such efforts represent the teacher's willingness to perform at their utmost level of production and attainment in doing their tasks and activities which will reflect positively on their students.

❖ **Punctual**: As teachers are role models for their students, an ideal teacher should stick to being on time so that his/her students would follow the same path. They need to be taught and shown punctuality regarding their assignments and other duties similarly.

❖ **Understanding**: An ideal teacher is also expected to understand student's needs and work towards making all the efforts to appreciate their circumstances and the reasons behind their actions or even their faults sometimes.

❖ **Patient**: A teacher is regarded as a parent who has a huge amount of patience for their students. They will need that patience in their every day dealings with students and their troubles. If teachers are short tempered, the students will create negative associations which might lead to some kind of reluctance to act freely and naturally with them and would therefore make a huge barrier between them.

❖ **Disciplinarian**: Controlling students is not an easy task added to the burden on teachers. Applying the proper techniques at the appropriate situations is a significant tip. Dealing with a variety of personalities is dazzling and requires a great knowledge in psychology particularly of children and adolescents. Falling to do so might results in chaos in the classroom and hence time and energy lost.

❖ **Caring:** A caring teacher becomes very popularly loved among students. It is a very vital quality that shows how much a teacher values the humanity of their students and accordingly students feel comfortable having such a teacher. This would also imply the ease that students get in dealing with such a teacher and the contentment students feel with him or her. They can speak about their personal problems and private concerns freely and expect a special treatment.

❖ **Respectful:** Students look up at their teachers. They are for them equivalent to their parents and close relatives. That should happen in cases where teachers are well viewed and respected by the students. This kind of view comes from the general vision that teachers gain within the community at large and the way they deal with the students particularly.

❖ **Reliable:** - This is one of the qualities that we as teachers want to implant in our students. That could be done through the teachers approaches they utilize with their students. It depends on how reliable the teacher is to allow for copying by students later on.

❖ **Motivating:** Motivation is an essential factor for both teachers and students. The teacher should be motivated enough to teach properly and deal with the students accordingly. That enthusiasm should be transmitted to students through the methods and procedures the teachers use.

❖ **Committed:** A teacher needs to commit himself/herself to the teaching profession. This would comprise taking the responsibility of their job and working on developing the aspects that regulate around it. Their presence and engagement is vital to enhance it and improve the quality of their own teaching methods and techniques.

❖ **Good communicator:** Communication is a vital aspect between student and teacher. It represents the core element in the teaching and learning processes. If communication is clear and productive between them then

positive results shall be expected. Teachers need to communicate their instructions and deliver the information clearly so that students would react logically and rationally.

❖ **Entertainer**: Students prefer the fun type of teachers who try to create a relaxing atmosphere in the classroom. At the same time, however, they expect that kind of fun teacher to balance the time of fun and the time of seriousness.

❖ **Well –prepared**: An ideal teacher should show the students his/her abilities and skills in the area of their subjects. This will clearly appear in the sequence of the lesson plans and how smoothly they move between the points being taught. They should ready to handle any sudden situation regarding the lesson and would fulfill the aims of the lesson successfully.

❖ **Helpful**: The kind of help that students anticipate from their ideal teacher is expanded among the responsibilities that the teacher needs to handle in and out of class. This could take form of realizing the individual difference between the students and trying to treat them accordingly whenever there is a need for help in its different forms.

❖ **Intelligent**: Intelligence is a quality that matters a lot to students. They consider it a crucial part of the whole educational process. In their views, an ideal teacher is an intelligent human being who can make them intelligent being as well. They also assume that their ongoing learning route is supposed to enhance their skills and advance their level of cleverness.

7. Write briefly about the efforts taken by you for developing indirect skills.

The efforts I made for developing the indirect skills are:

- I studied the topic prior in detail to have clear objective.

- I had to manage my time and save energy to the fullest since I had to take classes after attending college.

- Though they were all much younger than me but I tried to be as respectful towards them as possible.

- I tried being lenient with students at certain times.

- I tried being friends with the school students to be able to solve their problems even more easily.

- Sometimes told stories and motivational incidents to motivate the students and provide them with moral values other than the main subject of Mathematics. In this process my own personality also underwent a transformation in positive way.

- I tried to make the environment of classroom lighter by cracking some jokes.

- I carried positive attitude in every situation.

8. Write about your problems during internship.

By grace of **God**, I have no regrets in accepting the fact that I did not face as such problems during my internship. The overall internship process provides me with an opportunity to learn and gain. The only problems that I can analyze now are as follows:

- The biggest problem I faced was searching the school for internship; some schools hired their interns only one condition that we will do our internship on full working hours while others were not ready to take interns.

- Time management

- Completion of daily work

9. Write about your experience of internship.

My internship has taught me more than I could have imagined. This internship allows me to put everything that I've learned about education and my subject matter into action.

I've always dreamed to become a teacher and I never imagined this dream would come true so soon. Most importantly that no day is the same. Each day brings something different whether it is working on presentations, planning lessons or indulges in other activities.

The knowledge gained and skills acquired through this internship are things that complemented and enhanced the education I obtained in the classroom.

During this internship, I spent a lot of time in preparing each lesson plan. I worked hard to search different ways to present the information for each lesson. I looked for activities that my students would enjoy and I made sure that I had all of the materials and other things that I needed before class started. I figure out alternative activities in order to help my students to gain the most from the lessons.

My first teaching experience taught me a lot about what it means to be a teacher and a lot about myself; as a future educator. I knew teaching is difficult and coming up with lesson plans was not easy, so I'm glad that I had this experience which will prepare me for the future.

Overall, it was a great experience to use my teaching background and gain a better understanding of analyzing Mathematics subject.

10. Write benefits you expect from internship in future.

The benefits that I expect from my internship in future are:

❖ This internship provided me a glance as what my future career option is all about. Thus I will be more prepared for the option in future.

❖ Learnt time management

❖ Improvement in confidence level

❖ Leadership and skill development

❖ Enhancement in the capability of doing things

❖ Blending with new people

❖ Improvement in communication skills

❖ Accumulated evidence of my capabilities

❖ Gaining knowledge on would not learn anywhere else

❖ Improvement in intellectual habits.