Class VI

Subject : Mathematics

(i)<u>Topic</u>:- DATA HANDLING

(ii) **<u>Objective</u>**:-   1. To learn the concept of Tally marks frequency table

2. To learn the Concept of pictograph.

3. To learn the Concept of bar graph

3) **<u>P.K. Testing</u>** :- Teacher will check the previous knowledge of students

Q) What is data?

Q) Do you know the difference between raw data and organised data? Yes/ No

Q) What is pictograph?

4) **<u>Vocabulary used</u>**:- Data, Organising data, Frequency distribution, Pictograph, Bar graph.

5) **<u>Important Spellings</u>** :- Frequency, Organised, Tally marks, Bar graph.

6) **Explanation with Innovative methods lenis used**

Model, Chart, Graphs on Smart board, Task of collecting the data on a particular topic.

7)**<u>Procedure</u>** :- Teacher will introduce the topic with help of definitions.

<u>Data</u> :- Data is the collection of facts and figures to give some information. Teacher will introduce the topic of tally moves by taking an example of blood groups. Different blood groups A, AB, O, B. Arrange in order then prepare the frequency table. Teacher will do the activity in the class. Arrange the students in height wise. Then teacher will told the students to stand together some height wise therefore same students tally marks is 2(II) collect the data of five families of salary of parents then prepare the bar graph on it.

8) **<u>Students Partiapation</u>** :- Teacher will tell the students to collect data and show it on bar graph presentation.
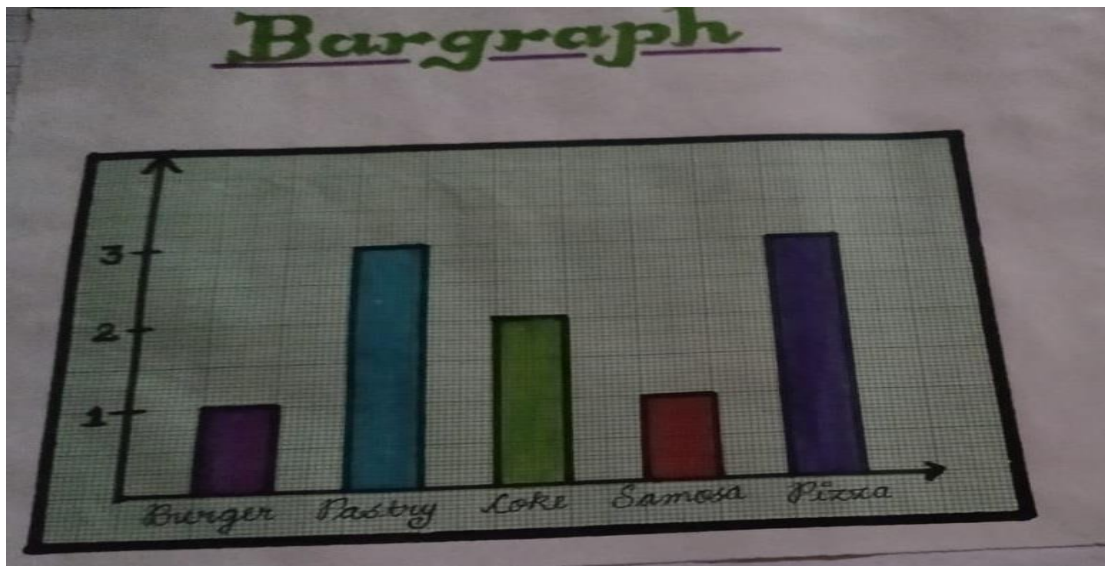
9) **Art Integration with other domain** :- Teacher will do the poem on bar graph.

When we make a bar graph

A bar graph

A bar graph

When we make a bar graph

These things we will need on axis

A Scale

The choices AND LABELS

Don't forget a little your bars And a key !

10) **Co-Scholastic Activities**

Activity II :- The students have to conduct a survey of eating habits and food preferences of family.

Survey for food preferences

Read the questions carefully and tick only one questions.

(i) **Food I like the most is**

North Indian   Chinese   Italian

(ii) **My favourite meal is**

Breakfast   Lunch   Dinner

(iii) **The desert I like the most is**

Cake   Ice cream   Fruits   Sweets   Chocolates
Others

11) **Recapitulation** :- Teacher will ask the following questions.

1. Define pictograph?

2. What is raw data?

3. Represents the frequency of number on _____

4. The weight of new born babies (in kg) 2.8, 3.0, 2.1, 2.5, 2.9, 2.3, 2.8, 2.9, 2.5, 2.7, 3.1, 3.7, 3.2, 3.5

Arrange the weight in ascending order.

(i) How many babies weight 2.9 kg?

(ii) How many babies more than 2.7 kg.

12) **Assessment** :- Q) Prepare a frequency table on different 4 types of sweets available in market and liking sweet of different people.

Q) Prepare a bar graph on watching on different sports on T.V.

13) **Resources** :- Smart Board, Graphs, Poem on bar graph, Collect data and Survey on different families.

14) **Learning outcomes** :-

(i) Students will able to understand how to collect, sort, organise and classify data.

(ii) Students will able to understand the concept of pictograph

Students will able to understand the concept of Bar graphs.

CH -KNOWING OUR NUMBERS

P.K Testing - 1. What are numbers?

2. Difference between place value and face value.

3. Do you know roman numeral ?

4. What are natural numbers?

Vocabulary Used - Round off , Roman Numerals , Brackets .

Important Spellings - International , Estimation , Roman Numerals.

Resources - PPT , Book , Work Book .

Aids/Innovative Methods used to explain the topic - Smart board , Place value charts , puzzles , Games Etc .

INNOVATIVE PEDAGOGY – Puzzle

Write a number using the digits 1,2,3 and 4 each only twice such that the 1's are separated by four digits , the 2's are separated by three digits , the 3's are separated by two digits and 4's are separated by one digit .

PROCEDURE – Teacher will introduce the topic with definition of natural numbers .

Numbers which starts from 1 are called natural numbers . In other qwords we can say that counting numbers are called natural numbers . Indian and International place value charts will be explained on board as well on smart class .

ESTIMATION – Estimation means approximate value .

RULES – Round off the number to nearest 10's .

If the digit at one 's Place is less than 5 , round down .

 If it is more than or equal to 5 then round up . E.g   67

                                             7 > 5 so round up to 70.

Similarly round off the number to nearest 100's 1000's and general rules will also be explained .

ROMAN NUMERALS – Will also be explained by writing rules and symbols on board .

 Seven basic symbols are :

 Hindu Arabic - 5   10   50   100   500 1000

    Roman's - V   X   L   C   D   M

CO-SCHOLASTIC ACTIVITY -

Participation of students – To check the concept of numbers teacher will give them a puzzle .

Complete the puzzle

a   b   c

                           d

e   f

                                          g

h

i

ACROSS –   a- Seventy two lakh four thousand five hundred sixty one

d - Predecessor of 9741

e - Successor of 123456

 g - CCLXVI + CXIX

i – Smallest 7 digit number

DOWN -   b – CDLXXIV

            c - 600000 + 7000 +800+70

            f -   Place value of 2 in 32075

            h - CXVI - LXXV

Teacher will encourage the students to solve this type of question from book (N.C.E.R.T) and also from workbook.

RECAPTULATION – Solve the following

   (i) Write the number name of the given numeral - (a) 34,23,19,196   (b) 342,319,196

  (ii) Write successor of 9999

(iii) Add smallest five digit number and greatest 4 digit number .

(iv) Write Roman numeral for (a) 179   (b) 64

(v) Estimate by genral rules 3965 X 512

ASSIGNMENT - Students will be asked to complete given assignments (W- sheet book)
which contains M.C.Q , True/False, Value Based Questions and some important sums .

 LAUGHTER TIME -

Q. 1 What quantity is represented by this
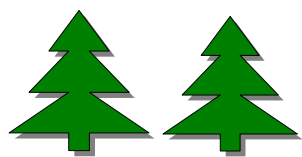
Ans . 9 (t(h)ree + t(h)ree + t(h)ree)

Q.2 A dust storm blows through , now how much do you have ?

Ans . 99 (Dirty tree (33) + Dirty tree + Dirty tree)

 LEARNING OUTCOME - 1) For any given number students can tell place value of the digits ,
write in words , round off .

2) For a given set of number students can compare them , arrange in order .

CH- WHOLE NUMBERS

P.K TESTING – 1. What are natural numbers ?

2. What is successor of -1?

3. What is the predecessor of smallest 5 digit number ?

4. Which are whole numbers , No response .

VOCABULARY USED – Closure , Associative , Commutative distributive .

IMPORTANT SPELLINGS – Associative , commutative , distributive , closure .

AIDS/INNOVATIVE METHODS TO EXPLAIN THE TOPIC – Smart board, Games , Charts ,
Puzzles etc .

PUZZLE - Using four 4's , mathematical operations + , - , / , X   and brackets create the
numbers 0, 1, 2 and 3 .

PROCEDURE – Teacher will introduce the topic with definition of whole numbers .

WHOLE NUMBERS – Numbers which starts from 0 are called whole numbers .

PROPERTIES OF WHOLE NUMBERS – (a) CLOSURE PROPERTY – For any whole numbers a and b

We have a+b is also a whole number . Let a=5   b=8   a+b =5+8= 13 which is also a whole number.

(b) COMMUTATIVE PROPERTY- For any two whole numbers we have a +b = b +a . for e.g

4+8=8+4=12.

(c)ASSOCIATIVE PROPERTY – For any three whole numbers a, b and c we have a+ (b+ c) = (a+ b) +c

For e.g 3+(6+2)=(3+6)+2=11.

(d) DISTRIBUTIVE PROPERTY of multiplication over addition and subtraction – For any three whole numbers a , b, and c we have   a X (b-c) = a X b + a X c

$$A \ X (b-c) = a \ X b - a \ X \ c .$$

(e) ADDITIVE IDENTITY -   a + 0 =0+a = a .

   For example 6+0=0+6=6.

INNOVATIVE PEDAGOGY - Participation of students – To check the concept of numbers teacher will give them a magic square to complete , in which the sum of the numbers in each row , column or diagonal being the same .

24		8	15	22
	12	14	21	
11	13	20	27	
17	19	26	28	
18			9	16

RECAPTULATION – Solve the following using properties

(i) 4692 x 97 + 4692 x 3

(ii) 168 x 109

(iii) How many whole numbers are smaller than 9 ?

(iv) The whole number P such that P / P = P IS ?

(v) All whole numbers are natural numbers yes / no ?

Teacher will encourage the students to solve this type of questions from book (N.C.E.R.T)

And also from workbook.

ASSIGNMENT – Students will be asked to complete given assignment i. e workbook , which contains M.C.Q , True/False , Value Based Question and some important facts .

LEARNING OUTCOME –

1 . The general outcome of whole number is to introduce 0 which is very important in number system .

2. The calculation speed will increase .

 3. Students will understand the concept of rearrangement.

CH – PLAYING WITH NUMBERS

P.K TESTING - 1 . What is 4 times 8 ?

2. What are even number ?

3. Is 19 an odd number ?

4. Do you know what are factors of 16 ?

VOCABULARY USED - Factors and multiples, prime and composite numbers, twin prime and co-prime , divisibility rules , prime factorization , least common multiple and highest common factor .

IMPORTANT SPELLINGS - Factorization , Divisibility , multiple , composite , prime etc.

AID/INNOVATIVE METHODS USED -   Teacher will explain this topic by role play (with the help of some students teacher will explain this topic by depicting a story)

ROLE PLAY – KINDS OF NUMBERS

Narrator – Good morning to one and all present here . today , we the students of class VI are going to present a role play on different kinds of numbers. I am Student A , the narrator. Student B and student C are playing the role of numbers (0-9) and different kinds of numbers . Let 's begin. As you know that mathematics develops the ability to think and in this enactment we are going to learn about the most common topic of maths   i.e Numbers .

 STUDENT B – Oh ! my head is aching . Mathematics is so difficult . What are these numbers ? Icant understand them .

STUDENT C – Maths is not difficult . Don 't worry dear friend , I will take you to the world of numbers .

NARRATOR – Both enter the world of numbers

STUDENT C - Hello friends ,meet my friend STUDENT B . He wants to know about numbers . Please introduce yourself to him .

Then , the numbers 0-9 come forward and introduce themselves .

After this , one by one , Different kinds of numbers i.e Even ,Odd ,Prime, Composite ,Co-prime and Twin-prime come forward and explain their meanings with example.

STUDENT C –Hey friends , there is something more about numbers . 1 is neither a prime number nor a composite number . It is a natural number . And if we talk about 0 , all the whole numbers start with 0 .

STUDENT B- Thank you my dear friends . you helped me to understand different kinds of numbers and I will never forget them in future .

NARRATOR – I hope you all have understood the concept of numbers . Thank you and have a wonderful day .

PROCEDURE- After role play teacher will again explain the topic with the help of smart class .

FACTORS – A factor is exact division of that number . e.g. factors of 16 = 1,2,4,8,16.

MULTIPLES – A multiple of number is the product that obtained by multiplying that number by non-zero number.

e.g First five multiples of 6 - 6,12,18,24,30.

PRIME NUMBERS – Numbers which have exactly two factors 1 and number itself . e.g 2,3,7,11. 2 is the only even prime .

COMPOSITE NUMBERS – Numbers which have more than two factors are called composite numbers . e.g 4,6,12,18 .

TWIN-PRIME NUMBERS – Two prime numbers whose difference is 2 is called as twin prime numbers.

e.g 11 and 13 , 71 and 73 .

CO-PRIME NUMBERS – Two numbers which have no common factor except 1 are called co-prime numbers . e.g 19 and 21 .

DIVISIBILITY RULES- FOR 2 – A number is divisible by 2 if the digit at one's place is 0 , 2, 4, 6,8 .

e.g 678, 3590 etc.

PRIME-FACTORISATION – Prime factorization is the process expressing a number as a product of prime factors .

e.g   24 = 2x2x2x3

HCF – HIGHEST COMMON FACTOR

Find the HCF of 12 and 48 .

Factors of 12 - 1,2,3,4,6,12

Factors of 48 – 1,2,3,4,6,12,16,24,48

So the HCF comes out to be 12 .

L.C.M – LEAST COMMON MULTIPLE –

Find the LCM of 12,48,60.

 ANS -   2x2x2x2x3x5x = 240 .

RELATION BETWEEN HCF AND LCM -   Product of two numbers = HCF X LCM

HCF = Product of two numbers / LCM

LCM =   Product of two numbers / HCF

PARTICIPATION OF STUDENTS – To check the concept of LCM/HCF . Teacher will give them an activity .

INNOVATIVE PEDAGOGY –

ACTIVITY - Find LCM of three numbers of your choice say 6,9,12.

Step 1 – Draw a grid of 10 x 10 as below .

1	2	3	4	5	**6**	7	8	**9**	10
11	**12**	13	14	15	16	17	**18**	19	20
21	22	23	**24**	25	26	**27**	28	29	30
31	32	33	34	35	**36**	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Step- 2 Take the first number 6 . Draw a circle around its multiples i.e 6,12,18 etc .

STEP 3- Take the 2nd number 9 . Draw a square around its multiples i.e 9,18,27, etc .

STEP 4 – Take the 3rd number 12 . Draw a triangle around its multiples i.e 12,24,36 etc .

STEP 5 – Now observe the grid and write down the numbers which have all three circles , squares and triangles .These are he common multiples of 6,9,12.

RECAPTULATION – Solve the following

1. Write the number which has exactly one factor .

2.   Find HCF of 52 and 65 .

3. Which is greatest 2 digit prime number ?

4. Is 51 a composite number ?

5. The LCM of two co-prime numbers is 4875. If one of the number is 75 find the other number ?

CO-SCHOLASTIC ACTIVITY

ASSIGNMENT - Students will be asked to complete W.sheets from work sheet book , do all M.C.Q and value based question etc.

LAUGHTER TIME

TEACHER – Who can tell me what 7 times 6 is ?

STUDENT – Its 42.

TEACHER – Very good and who can tell me what 6 times 7 is ?

STUDENT – Its 24 !

LEARNING OUTCOME – 1. Give the general form of two digit number and its reverse .

2. Give the general form of three digit number and its reverse .

3. Solve puzzles in general forms of numbers .

4. Check the divisibility of a number by 2,3,5,9,10,6,11.

TOPIC - INTEGERS

Objectives: Students will be able to understand

(iii) What is an integers and rules involving operation on integers

(iv) Solve problem involving operation on integers

(v) Apply integers in real world applications.

P.K Testing:

1) Define whole numbers

2) How many whole numbers lie between 15 and 25.

3) Successor of 9999 is.

Vocabulary Used:	Positive Words	Negative Words
	Deposit	Withdrawal
	Increase	Decrease
	Forward	Backward
	Ascending	Descending

Important Spellings: Below, Temperature, Additive, Inverse

Innovative Method Used to explain the topic:

Teacher will tell them a song to learn the rules for addition and subtraction of integers

Integers Song

Lyrics

Same sign keep and Add

Different signs subtract

Keep the sign of bigger number

Then answer will be exact

Procedure: Teacher will introduce the topic with definition of integers.

Integers: Positive and negative numbers along with zero are called integers. Positive numbers lie on the right hand side of zero on number line and negative integers lie on the left side of number line. Teacher will explain same topic with the help of smart class. After this teacher will explain them game given at page 123, 124 in NCERT Book.

Teacher will explain the integers to the students on number line also

INTEGER RACE
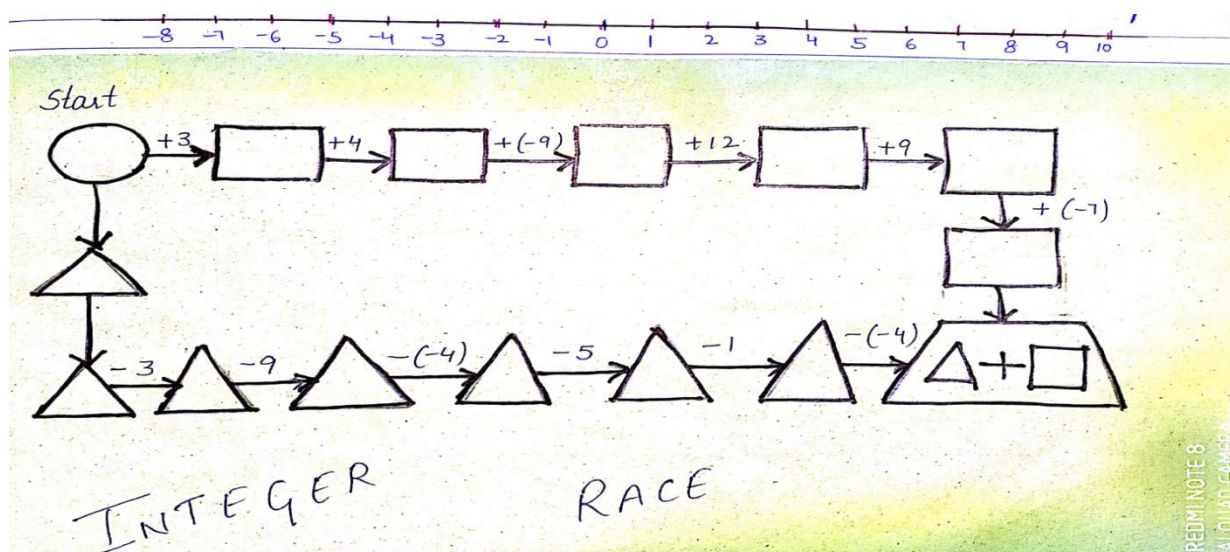
Participation of Students:

(iv)   Write opposite of 100 meter above Sea level.

(v)   Which is greatest negative integers.

(vi)   Find (-1) + (-3)

Recapitulation: Solve the following

5.   -7-6

6.   -8+15

7.   15-11

8.   +15-7

Art Integration with other domain: Students will learn to integrate mathematics with different module of art such as painting drawing etc.

Learning Out Come:

Students will be able

(iii)   Apply integers in real world.

(iv)   To solve problem involving operation on integers.

(v)   Learn the rules of integers.

Resources: Smart Board, Black Board, Chalk.

Co – Scholastic Activity: This topic will enhance the problems solving skill of the students

Assessment: Students will be asked to complete given assignments containing MCQ, Hot Questions, Value based and few important sums based upon daily life will be discussed.

Topic: Algebra

Objective:

1) The first aim of teaching algebra is to help in expression of abstract ideas, words and phrases as the instrument of ideas are replaced by symbols.

2) Teaching of algebra should enable the students to use in solution of some of stiff problems in arithmetic.

3) This inculcates in students the power of accurate analysis.

P.K Testing:

a) Take a number then add 5 to it what answer will you get.

b) Take a number multiply it with 2 and add 5 to it.

Vocabulary Used: Variable, Constant, Algebraic expressions.

Important Spellings: Variable, Constant, algebraic expressions, trail, equation.

Explanation with Innovating ideas: Teacher will introduced the topic with the help of puzzle.

PUZZLE

What is missing number?

(iii) 2 = 4

Ok, the answer is 6, right? Because 6-2 = 4

Well in algebra, we don't used blank boxes we use a letter (usually an x or y, but any letter is fine), So we right x – 2 = 4

The letter (in this case any) just means we don't know this yet and is often called unknown or variable.

And when we solve it we write

x = 6

Procedures: Teacher will explain following definition

(i) Algebraic Expression: An algebraic expression is a mathematic expression that consists of variables, numbers and operations.

(ii) Variable : A variable is a special type of amount or quantity with an unknown value.

(iii) Constant: A constant is a number on its own or sometimes a letter such as a, b or c to stand for a fixed number example in "x+5 = 9" where as 5 and 9 are constants.

Students Participation:

Activity

Quick group: For this game, create a set of index cards with algebraic expressions on them. You should create latest one card for every person in your class. For each card, there should be three others that are expressions have same value. To play give the card randomly to the students in your class. Students are given certain amount of time to get into groups where everyone. Has a card of same value. When they are done check to see if students are correct and then cards can be collected, reshuffled and handed out randomly again.

Recapitulation: *Riddle*

Solve for 'x', write the corresponding letter in space below that matches your answer .

1.	$8+x = 16$	A	5)	$2x-8 = 6$	N
2.	$x-10 = 0$	B	6)	$4 + 3x = 7$	P
3.	$2x + 5 = 9$	C	7)	$4x - 4 = 16$	R
4.	$9+2x = 17$	E	8)	$6+2x = 24$	S

Art integration with other domain: Students will learn to integrate math with different module of art such as painting, drawing etc.

Learning outcome: After studying this course, you should be able to

(i) Recognize technical terms and appreciate some of uses of algebra.

(ii) Solve simple linear equations.

(iii) Collect like terms and simplify expressions.

Resources: Smart board, colored paper, Blackboard.

Co- Scholastic activity: This topic will enhance the decision making skill of students

Assessment: Teacher will ask the students to solve the question given in worksheet book.

Topic: Basic Geometrical Ideas:

Objectives: Students will be able to

(i) Understand the properties of quadrilaterals

(ii) Distinguish between different types of quadrilateral.

(iii) Grasp the concept of symmetry in different types of quadrilaterals.

PK Testing: Teacher will draw figure of line, line segment, Ray, Parallel lines, Circle on board and ask the students one by one about these figures.

Vocabulary Used: Quadrilateral, Diameter, Radius, Chord, Circumference, Curve, polygons.

Important Spellings: Point, Segment, Parallel, Intersecting, Curve, Quadrilateral.

Explanation with innovative Ideas: Teacher will explain the topic with the help of following activity.
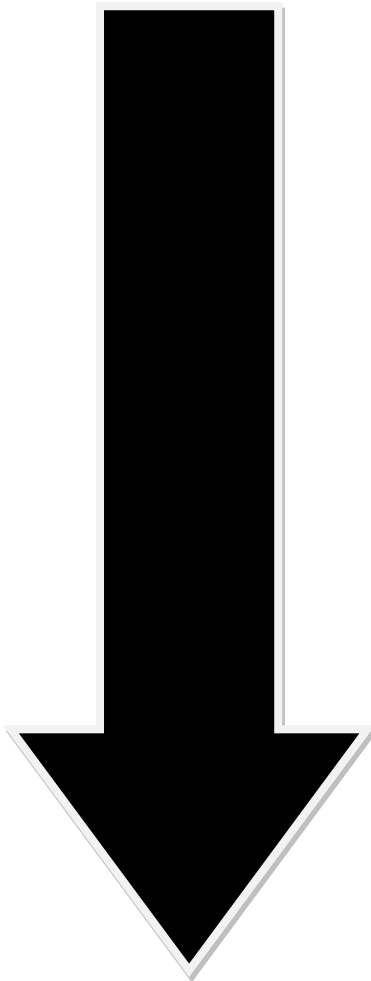
6. Use scale and join the vertices with 19 and 7 as shown in Fig. 6.
7. Use scale and join the vertices with 23, 24 and 25 as shown in the Fig. 7
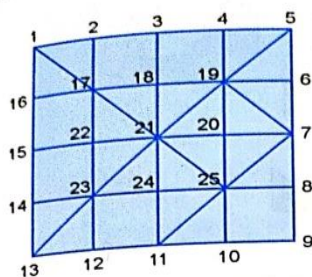
Fig. 6
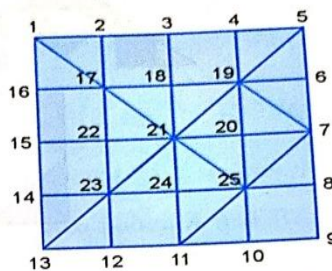
Fig. 7

8. Colour the figure as shown in Fig. 8
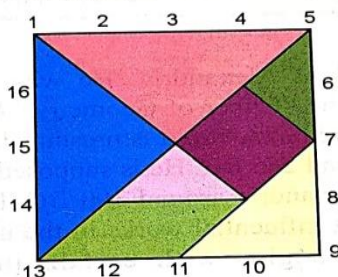
Fig. 8

9. Cut out the seven pieces as shown in Fig. 9
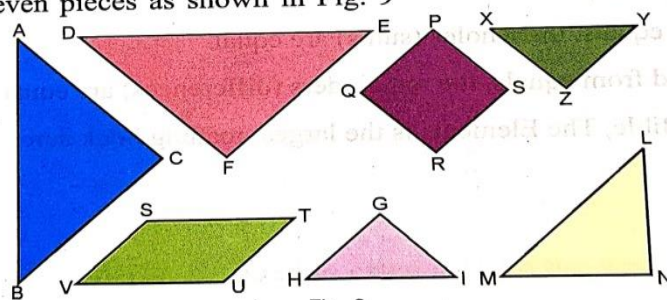
Fig. 9

Observations :

1. The shape ◆ is a _____.

2. The shape ▱ is a _____.

3. The two triangles △ are _____.

4. The two triangles ▼ ▲ are _____ triangles.

5. The two triangles △ ▼ are _____ triangles.

6. These seven shapes are called _____

Maths Lab Activity-3

Objective : (i) To make a set of tangrams.

(ii) Using the tangram pieces to make the letters of English alphabet like A, B, C, D, ..., Z.

Materials Required : Coloured paper, sketch pens, pair of scissors, etc.

Procedure :

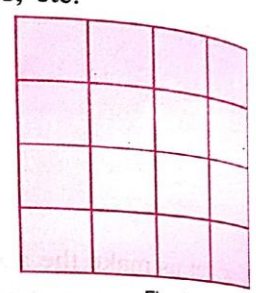1. Take a coloured paper and draw a square of 4 cm × 4 cm. Divide the square into 16 unit squares as shown in Fig. 1.

Fig. 1

2. Write the numbers to each vertex of the unit square as shown in figure 2.
3. Use scale and join the vertices with 1, 17, 21, and 25 as show in figure 3.
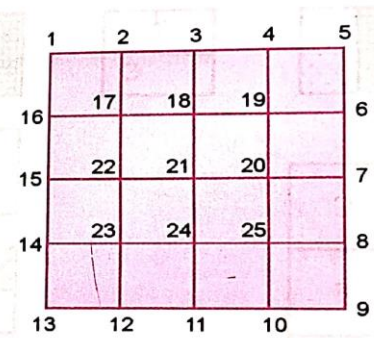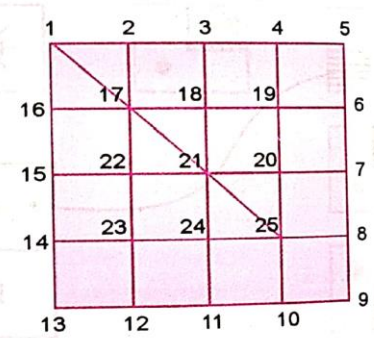

Fig. 2

Fig. 3

4. Use scale and join the vertices with 13, 23, 21, 19 and 5 as shown in Fig. 4.
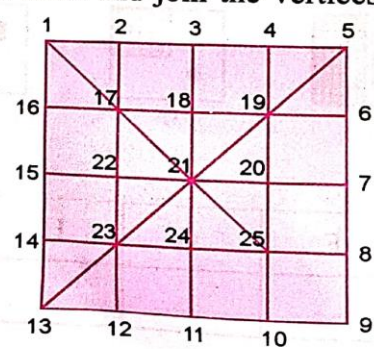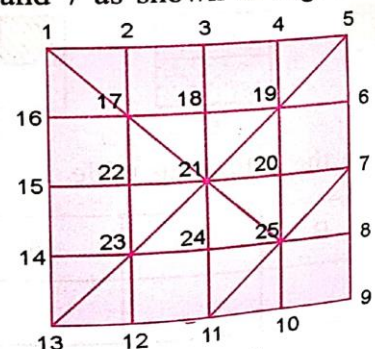5. Use scale and join the vertices with 11, 25, and 7 as shown in Fig. 5.

Fig. 4

Fig. 5

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Procedure: Teacher jwill explain the following definitions.

- (i) Line   It is the figure having no end point.

- (ii) Line segment: Having two end points.

- (iii) Ray: A ray is a portion of line starting and going in one direction endlessly.

- (iv) Parallel lines: Two lines in a plane are said to be parallel if they do not meet.

- (v) Curve: It is a figure which we draw without lifting the pencil from the paper it is of two types a) closed curve b) open curve

- (vi) Polygon: A polygon is a simple closed curve made of line segment.

- (vii) Circle: A circle is the path of a point moving at same distance from a fixed point it has following parts a) Chord b) Diameter c) Sector d) Segment.

- (viii)   Intersecting Lines: Two distinct lines meeting at a point are called intersecting lines.

Student's Participation: Students will make letters of English alphabet by using seven pieces of tangram which they have made earlier in the activity.

Recapitulation: Teacher will ask questions related to the different figures.

Art Integration with other domain: Students will learn to integrate mathematics with different module of art such as painting, drawing etc.

Learning out comes: At the end of the chapter students will be able to

- (i) Understand the concept of point, line, line segment, ray, angle, triangle, quadrilateral and circle.

- (ii) Apply the knowledge in different situations

Resources: Smart Board, Black Board, Colored paper, Scissors.

Co- Scholastic Activity: This topic will enhance the decision making skill of the students.

Assessment: Students will be asked to complete the questions given in worksheet book and draw the different figure on colored paper and paste in the note book.