Class I (Mathematics)

Suggested Pedagogical Processes	Learning Outcomes
The learner may be provided opportunities in pairs/groups/individually and encouraged to: ➢ observe different contexts and situations from the immediate environment such as the things that are inside/outside the classroom. They may be encouraged to use the spatial vocabulary/concepts like a top - bottom, on - under, inside - outside, above - below, near –far, before - after, thin – thick, big – small, etc. ➢ identify and draw the things which are near - far, tall -short, thick – thin, etc. ➢ handle concrete materials or models and classify them. For example, objects which are round in shape like chapati, ball, etc. and which are not round such as pencil box. ➢ count objects like, students may take out objects up to 9 from a given collection of objects such as picking any 8 leaves/ 4 beads/ 6 ice cream sticks etc., from the given box. ➢ take out objects up to 20 from a given collection of objects. ➢ use words like more than, less than or equal through the strategy of one to one correspondence in objects in two groups. ➢ explore different strategies to add numbers up to 9 like counting on forward and using already known addition facts. ➢ evolve different strategies to subtract numbers up to 9 like recounting after taking out objects from a given collection. ➢ use different strategies like aggregation, counting forward, using addition facts, etc. to extend addition upto 20 (sum not exceeding 20) ➢ develop different strategies of taking away through objects/ pictures. ➢ count in groups of tens and ones for numbers more than 20. Like, 38 has 3 groups/bundles of ten each and8 loose(ones). ➢ sort objects based on similarities and differences through their sense of touch and observation. ➢ verbalise the properties of shapes/criteria used by them in sorting/classifying solids/ shapes ➢ use concrete play money for making amounts up to Rs 20. ➢ finds short lengths in their immediate environment. using nonuniform ➢ units like a finger, hand span, length of a forearm, footsteps, etc. conduct classroom discussions on observation of pattern and allow them to describe in their own language. Let children find what will come next and justify the answer. ➢ observe and collect information from the visuals, contexts/ situations such as number of items.	**The learner:** ● works with numbers 1 to 20 ● classifies objects into groups based on some physical attributes like shape, size and other observable properties including rolling and sliding. ● recites number names and counts objects up to 20,concretely, pictorially and symbolically. ● counts objects using numbers 1 to 9. ● compares numbers up to 20. For example, tells whether the number of girls or the number of boys are more in the class. ● applies addition and subtraction of numbers 1 to 20 in daily life ● constructs addition facts up to 9 by using concrete objects. For example to find 3+3 counts 3 steps forward from 3onwards and concludes that 3+3=6. ● subtracts numbers using 1 to 9. For example, the child takes out 3 objects from a collection of 9 objects and counts the remaining to conclude 9-3=6 ● Solves day to day problems related to addition & subtraction of numbers up to 9. ● recognizes numbers up to 99 and writes numerals. ● describes the physical features of various solids/shapes in her own language. For example- a ball rolls, a box slides etc. ● estimates and measures short lengths using non-uniform units like a finger, hand span, length of a forearm, footsteps, etc. ● observes, extends and creates patterns of shapes and numbers. For example arrangement of shapes/ objects/numbers, etc. like .... · (i) · 1,2,3,4,5,……………………………. · 1,3,5,………………………………… · 2,4,6,………………………………… 1,2,3,1,2,…, 1,…3,………….. ● collects, records (using pictures/ numerals) and interprets simple information by looking at visuals. (For example in a picture of a garden the child looks at different flowers and draws inference that flowers of a certain colour are more). ● Develops concept of zero.

Class II (Mathematics)

Suggested Pedagogical Processes	Learning Outcomes
The learner may be provided opportunities in pairs/ groups/ individually and encouraged to: ➢ identify number naming & number writing patterns, read and write numbers up to 99. ➢ apply the understanding of place value of numbers while grouping & recognising them. ➢ add 2 digit numbers up to 99 by using addition facts up to 9. ➢ develop and use alternate strategies for addition and subtraction of numbers ➢ explore situations in which addition and subtraction of numbers is required. For example combining two groups, enlarging a group by adding more objects. ➢ develop their own contextual situations/questions based on subtraction and addition. ➢ create situation/ context in which a number has to be repeatedly added. ➢ trace different faces of 3D objects on paper and naming their corresponding 2D Shapes. ➢ classify shapes based on their physical attributes through cut out/paper folds of different shapes. ➢ use observations/ sense of touch to describe the shapes and their physical attributes. ➢ add up to numerical value of Rs. 100, by using concrete play money of different denominations ➢ measure different lengths/ distances by using uniform but a non-standard unit. ➢ discuss and share the experiences of children while they observe different balances for weighing objects. ➢ construct their own balance (simple) and weigh and compare the weights of different things around them. ➢ compare the capacity of two or more containers. ➢ discuss about the special day/ particular day of a week when children share time and house-related work with their family members. ➢ verbalise the unit of repeat in a pattern and make ideas about their extension ➢ extend patterns created by using shapes, thumb print, leaf print and numbers, etc. ➢ collect information from people around, record it and draw some inference from it.	**The learner:** ● works with two digit numbers ● reads and writes numerals for numbers up to 99. ● uses place value in writing and comparing two digit numbers. ● forms the greatest and smallest two digit numbers (with and without repetition of given digits). ● solves simple daily life problems/situations based on addition of two digit numbers. ● solves daily life situations based on subtraction of two digit numbers. ● represents an amount up to Rs. 100 using 3-4 notes and coins(of same/ different denominations). ● describes basic 3D and 2D shapes with their observable characteristics ● identifies basic 3D-shapes such as cuboid, cylinder, cone and sphere by their names. traces 2D outlines of 3D objects. ● identifies 2D shapes (rectangle, square, triangle, circle) by their names. ● distinguishes between straight and curved lines. ● draws/represents straight lines in various orientations (vertical, horizontal, slant). ● estimates and measures length/distances and capacities of containers using uniform non-standard units like a rod/pencil, cup/spoon/bucket etc. ● compares objects as heavier/lighter than using simple balance. ● identifies the days of the week and months of the year ● sequences the events occurring according to their duration in terms of hours/days, for example, does a child remain in school for a longer period than at home? ● draws inference based on the data collected such as 'the number of vehicles used in Samir"shouse is more than that in Angeline"s'. · Identifies the values of currency notes up to 100/coins and performs addition and subtraction operations.

Class III (Mathematics)

Suggested Pedagogical Processes	Learning Outcomes
The learner may be provided opportunities in pairs/ groups/ individually and encouraged to: ➢ count large number of objects from their surroundings by making groups of 100,10 and ones. ➢ write a number (up to 999) and the other group reads it. apply place values for writing greatest/ smallest numbers with three digits. (Digits may or may not repeat.) ➢ arrange concrete objects and draw different multiplication facts/ combinations of a given number, For example 6 mangoes can be arranged as ➢ develop multiplication facts of 2, 3, 4, 5 and 10 using different ways e.g. Skip counting and by using repeated addition ➢ experience equal sharing and grouping and connecting them mathematically in their own context. For example, sharing of equal number of sweets among children. ➢ observe various 3D shapes available in the surroundings and discussions may be held for identification of similarities and differences with respect to their corresponding 2D. Shapes like triangles, squares, circle cutouts of cardboard. ➢ make 2D shapes through paper folding/paper cutting activities. ➢ describe the properties of 2D shapes in their own words/languages like number of corners, shape of edges, etc. ➢ discuss their observation regarding various shapes they observe in their surroundings – on the floor, on the footpath, etc., to draw conclusion that all shape do not tile. ➢ conduct role play of seller and buyer in selling/buying situation where lots of addition and subtraction of amounts using play money may be done. ➢ measure the length of objects in their surroundings by using scale/ tape. Students may be encouraged to estimatethe length first and then verify it by actual measurement. ➢ use simple balance to compare and find weight of common objects in terms of non-standard units likes small stones, packets of objects, etc. ➢ measure capacities of different containers and describe their experiences of doing so, e.g. finding how many jugs can fill a basket or how many glasses can be filled with one jug of water. ➢ use of vocabulary about time and calendar through discussions/story telling ➢ attempt to read a clock and calendar. ➢ observe patterns both geometrical and numerical and discuss them. (Presentation by the group may be done in front of the whole class) ➢ collect and record data in their own way and use pictographs to represent it. For example flowers of	**The learner:** ● works with three digit numbers - reads and writes numbers up to 999 using place value. - compares numbers up to 999 for their value based on their place value. - solves simple daily life problems using addition and subtraction of three digit numbers with and without regrouping, sums not exceeding 999 - constructs and uses the multiplication facts (tables) of 2, 3, 4, 5 and10 in daily life situations. - analyses and applies an appropriate number operation in the situation/ context. - explains the meaning of division facts by equal grouping/sharing and finds it by repeated subtraction. For example, 12÷3 as number of groups of 3 to make 12 and finds it as 4 by repeatedly subtracting 3 from 12 - adds and subtracts small amounts of money with or without regrouping. - makes rate charts and simple bills ● acquires understanding about 2D shapes - identifies and makes 2D-shapes by paper folding, paper cutting on the dot grid, using straight lines etc. - describes 2D shapes by the number of sides, corners and diagonals. For example, the shape of the book cover has 4 sides, 4 corners and two diagonals - fill a given region leaving no gaps using a tile of a given shape. ● estimates and measures length and distance using standard units like centimetres or metres & identifies relationships. ● weighs objects using standard units - grams & kilograms using simple balance ● compares the capacity of different ● containers in terms of nonstandard units. ● adds & subtracts measures involving grams & kilograms in life situations ● identifies a particular day and date on a calendar. ● reads the time correctly to the hour using a clock/watch. ● extends patterns in simple shapes and numbers. ● acquires understanding about data handling.

different colours in the school garden or the number of boys and girls present in a class. ➤ to interpret pictographs from magazines and newspapers which can be displayed in the classroom.	● records data using tally marks, represents pictorially and draws conclusions

Class IV (Mathematics)

Suggested Pedagogical Processes	Learning Outcomes
The learner may be provided opportunities in pairs/ groups/ individually and encouraged to: ➢ explore and write multiplication facts through various ways like skip counting, extending patterns, etc. For example, for developing multiplication table of 3, children could use either skip counting or repetitive addition or pattern ➢ expand the two digit number and multiply. For example, 23multiplied by 6 could be solved as follows: 23×6 = (20+3) ×6 = 20×6+3 ×6 = 120+18 = 138 ➢ solve and create daily life problems using multiplication like, if a pen costs Rs. 35 what will be the cost of 7 pens? ➢ discuss and evolve standard algorithm for multiplication. ➢ make groups for division, e.g. 24÷3 means i.e. to find how many groups of 3 can be there in 24 or how many 3"s make 24. ➢ create contextual questions based on mathematical statements. For example the statement 25 – 10 = 15 may trigger different questions from different students. A student may create. "I had 25 apples. Ten were eaten. How many apples are still left?" ➢ create contextual problem through group activity such as dividing the class in two groups where one group and the other solves by using different operations and vice- versa ➢ to discuss and co-relate fractional numbers like half, one fourth, three fourths.\ ➢ represent the fractional numbers through activities related to pictures/paper folding. For example – shade half the picture Shaded part of which of the following pictures do not represent one fourth (1/4) ➢ draw circles with various lengths of radius, compasses and explores various design with the shape. ➢ discuss observation on tiling (of different shapes) which they see in their homes/ on footpaths/floors of various buildings. ➢ make their own tiles and verify whether the tiles they created tessellate or not. ➢ look at various objects in the classroom from different viewpoints and make a deep drawing of the view. For example a glass may look like this from the front. Questions like, „But how it would look like from the top?" Or „how it would look like from below?" maybe raised ➢ convert rupees into paisa: For example how may 50 paisa coins you will get in exchange for 20 rupees. ➢ make bills so that the students will use the four operations of addition/subtraction/ multiplication/division during the activity.	**The learner:** ● applies operations of numbers in daily life ● multiplies 2 and 3 digit numbers ● divides a number by another number using different methods like: ● pictorially (by drawing dots) ● equal grouping ● repeated subtraction ● by using inter-relationship between division and multiplication ● creates and solves simple real-life situations/ problems including money, length, mass and capacity by using the four operations. ● works with fractions ● identifies half, one-fourth, three-fourths in a given picture (by paper folding) and also in a collection of objects. ● represents the fractions as half, one fourth and three-fourths by using symbols $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$ respectively. ● shows the equivalence of $\frac{1}{2}$ and $\frac{2}{4}$ and other fractions. ● acquires understanding about shapes around her/him ● identifies the centre, radius and diameter of the circle. ● finds out shapes that can be used for tiling. ● draws cube/ cuboids using the given nets. ● shows through paper folding/ paper cutting, ink blots, etc. the concept of symmetry by reflection. ● draws top view, front view and side view of simple objects. ● explores the area and perimeter of simple geometrical shapes(triangle, rectangle, square) in terms of a given shape as a unit like the number of books that can completely fill the top of a table. ● converts metre into centimetre and vice versa. ● estimates the length of an object/distance between two locations, the weight of various objects, the volume of liquid, etc., and verifies them by actual measurement. ● solves problems involving daily life situations related to length, distance,

- ➢ first estimate the length of an object/ distance and then verify them by actually measuring them. For example, estimating the length of their bed or distance between the school gate and the classroom and verifying it by measuring them.
- ➢ make a balance and weigh things with standard weights. In case standard weights are not available, packages with standard weights may be used like packets of ½ Kg dal, 200 gm pack of salt, 100 gm pack of biscuits.
- ➢ innovate use of weights like using two 250 gm packets instead of 500gm packet (or by using stones of equivalent weights, etc.)
- ➢ make their own measuring vessel to measure capacities of other vessel. For example – a bottle may have capacity for 200 ml and can be used as a measurement unit to know the amount of water in a jug or in a container.
- ➢ observe and study the calendar and come up with number of weeks in a month/ in a year. Let children explore the pattern in number of days in each month and how days are associated with dates in a month, etc.
- ➢ utilise their experiences inside/outside the class having exposure to telling time/ reading clock in hours and minutes allowing peer learning.
- ➢ discover the time lapsed in an event by counting forward or using subtraction/ addition are created.
- ➢ explore patterns/ designs in their environment (using shapes and numbers) and can be encouraged to make such patterns and extend them.
- ➢ collect information and draw meaningful results in their daily life. Using these experiences, the children may be involved in activities focusing on data handling.
- ➢ read data/bar graphs, etc., from newspapers/magazines and interpret them.

- weight, volume and time involving four basic arithmetic operations.
- reads clock time in hour and minutes and expresses the time in a.m. and p.m.
- relates 24 hr clock with respect to 12 hr clock.
- calculates time intervals/duration of familiar daily life events by using Forward or backward counting/addition and subtraction.
- identifies the pattern in multiplication and division (up to multiple of 9).observes, identifies and extends geometrical patterns based on symmetry.
- represents the collected information in tables and bar graphs and draws inferences from these.

Class V (Mathematics)

Suggested Pedagogical Processes	Learning Outcomes
The learner may be provided opportunities in pairs/ groups/ individually and encouraged to: ➢ discuss contexts/ situations in which a need arises to go beyond the number 1000 so that extension of the number system occurs naturally. For example number of grams in10 Kg, number of metres in 20 Km, etc. ➢ represents numbers beyond 1000 (up to 100000) using place value system, like extend the learning of numbers beyond 9thousand, how to write number one more than 9999. ➢ operate (addition and subtractions) large numbers using the standard algorithm. This may be identified as extension of the algorithm for one more place. ➢ use a variety of ways to divide numbers like equal distribution and inverse process of multiplication ➢ develop the idea of multiples of a number through its multiplication facts, skip counting on a number line and number grid. ➢ develop concept of factors through division of numbers and multiples. ➢ estimate the result through approximations and then verifies it. ➢ discuss and use contexts/ situations from daily life in activities to develop understanding about fractional part of the group like, how many bananas are there in half a dozen bananas? ➢ compares fractions through various ways like paper folding, shading of diagram etc. ➢ develop the idea of equivalence of fractions through various activities. For example by paper folding and shading: ➢ understand the idea of decimal fractions(^{1}��ℎ ����� ^{1}��ℎ) 10 100 ➢ develop earlier understanding of angles and to describe it. ➢ observe angles in their surroundings and compare their measures. For example, whether the angle is smaller, bigger or equal to a corner of a book which is a right angle; further, classify the angles. ➢ introduce a protractor as a tool for measuring angles and use it to measure and draw angles. ➢ explore symmetry by using paper folding/ paper cutting ➢ explore shapes so that they can find out that some shapes look the same only after one complete rotation/part of a rotation ➢ plan their shopping–to make estimates of money (in different denominations) and the balance money one would get. ➢ conducts role play of shopkeepers/ buyers in which students create bills. ➢ measure the length of different objects using a tape/ metre scale.	**The learner:** ● works with large numbers ● reads and writes numbers bigger than 1000 being used in her/his surroundings. ● performs four basic arithmetic operations on numbers beyond1000 by an understanding of the place value of numbers · divides a given number by another number using standard algorithms. ● estimates sum, difference, product and quotient of numbers and verifies the same using different strategies like using standard algorithms or breaking a number and then using operation.(For example, to divide 9450 by 25, divide 9000 by 25, 400 by 25, and finally 50 by 25 and gets the answer by adding all these quotients). acquires understanding about fractions · finds the number corresponding to part of a collection. ● identifies and forms equivalent fractions of a given fraction. ● expresses a given fraction^1,^{1},^{1}in 2 4 5 decimal notation and vice versa. For example in using units of length and money- half of Rs.10 is Rs.5 ● converts fractions into decimals and vice versa. explores ideas of angles and shapes ● classifies angles into right angle, acute angle, and obtuse angle and represents the same by drawing and tracing. ● identifies 2D shapes from the immediate environment that have rotation and reflection symmetry like alphabet and shapes. ● makes cube, cylinder and cone using nets designed for this purpose. ● relates different commonly used larger and smaller units of length,weight and volume and converts larger units to smaller units and vice versa. ● estimates the volume of a solid body in known units like volume of a bucket is about 20 times that of a mug. ● applies the four fundamental arithmetic operations in solving problems involving money, length, mass, capacity and time intervals ● identifies the pattern in triangular number and square numbers.

➢ appreciates the need of converting bigger units to smaller units. ➢ discuss experiences on units of capacity printed on water bottles, soft drink pack, etc. ➢ fill a given space by using different solid shapes, cubes, cuboids, prisms, spheres, etc. and encourage students to decide which solid shape is more appropriate. ➢ Measure volume by counting the number of unit cubes that can fill a given space ➢ explore patterns in numbers while doing various operations and ➢ to generalise them like patterns in square numbers. A triangular number like as shown below also form a pattern ➢ collect information and display it in a pictorial form. For example, heights of students from their class and represent it pictorially. ➢ collect and discuss various diagrams/ bar charts from the newspapers/magazines may be in the class.	● collects data related to various daily life situations, represents it in tabular form and as bar graphs and interprets it.

Suggested Pedagogical Processes	Learning Outcomes
The learner may be provided opportunities in pairs/ groups/ individually and encouraged to: ➢ encounter situations having numbers up to 8 digits. e.g. cost of the property, the total population of different towns, etc. ➢ compare numbers through situations like cost of two houses, number of spectators, money transactions, etc. ➢ classify numbers on the basis of their properties like even, odd, etc. ➢ observe patterns that lead to divisibility by 2,3,4,5,6,8,10 and 11. ➢ create number patterns through which HCF and LCM can be discussed. ➢ explore daily life situations to involve the use of HCF and LCM. ➢ create and discuss daily life situations involving the use of negative numbers. ➢ situations that require the representation by fractions and decimals can be created and presented pictorially. ➢ use different contexts of mathematics to appreciate the necessity of representing unknowns by variables (alphabet). ➢ explore and generalise the need of using variables alphabets. ➢ describe situations involving the need for comparing quantities by taking ratio. ➢ discuss and solves word problems that use ratios and unitary method. ➢ explore various shapes through concrete models and pictures of different geometrical shapes like triangles and quadrilaterals, etc. ➢ identify various geometrical figures and observe their characteristics in and outside the classroom environment either individually or in groups. ➢ make different shapes with the help of available materials like sticks, paper cutting, etc. ➢ observe various models and nets of 3-Dimensional (3-D) shapes like cuboids, cylinders, etc. and discuss the elements of 3-D figures such as faces, edges and vertices. ➢ share the concept of angles through some examples like opening the door, opening the pencil box, etc. Students can be asked to give more such examples from their surroundings. ➢ classify angles based on the amount of rotation. discuss and draw 60° angles using compasses, the construction of other angles like 30°, 120°, etc. can be discussed with the children. ➢ observe the reflection symmetry of a shape by using a mirror or folding a paper cut out of a shape along specific lines.	**The learner:** ● solves problems involving large numbers by applying appropriate operations (addition, subtraction, multiplication and division). ● recognises and appreciates (through patterns) the broad classification of numbers as even, odd, prime, co-prime, etc. ● applies HCF or LCM in a particular situation. ● solves problems involving addition and subtraction of integers. ● uses fractions and decimals in different situations which involve money, length, temperature etc. For example, $7\frac{1}{2}$ metres of cloth, the distance between two places is 112.5 km etc. ● solves problems on daily life situations involving addition and subtraction of fractions/decimals. ● uses variable with different operations to generalise a given situation. For example, the Perimeter of a rectangle with sides x units and 3 units is 2(x+3) units. ● compares quantities using ratios in different situations. For example the ratio of girls to boys in a particular class in 3:2. ● uses unitary method in solving various word problems. For example, if the cost of a dozen notebooks is given she finds the cost of 7 notebooks by first finding the cost of 1 notebook. ● describes geometrical ideas like line, line segment, open and closed figures, angle, triangle, quadrilateral, circle, etc., with the help of examples in surroundings. ● demonstrates an understanding of angles by identifying examples of angles in the surroundings. ● classifying angles according to their measure. ● estimating the measure of angles using 45°, 90°, and 180° as reference angles. ● demonstrates an understanding of line symmetry by identifying symmetrical 2-Dimensional (2-D) shapes which are symmetrical along one or more lines creating symmetrical 2-D shapes. ● classifies triangles into different groups/types on the basis of their

| ➢ identify symmetrical shapes from surroundings like leaves, windows, doors, etc
➢ draw lines of symmetry when shapes are given. Group activity can be given, in which one group can draw half of the symmetrical shape and the other group can complete the shape.
➢ sort out the given set of triangles based on their angles and sides (group activity), and discuss the basis of their classification.
➢ sort out the given set of quadrilaterals into different groups based on their shapes/size, etc. to explain the reason for the classification.
➢ differentiate 2-D and 3-D objects by differentiating the shape of the top of the pencil box and the entire pencil box, to add more examples of this type from the surroundings.
➢ discuss the various aspects of a 3-D object, like edges, vertices, and faces.
➢ introduce the concept of perimeter using different rectangular shapes from the classroom like
➢ blackboard, tabletop, books, etc, through the idea of the boundary of these shapes.
➢ develop the concept of areas through measurement of the region inside a shape by dividing it into square units.
➢ explain the importance of arranging information in daily life situations involving numbers such as
➢ cricket scores in different cricket matches, the number of family members in different families.
➢ explore his/her own ways of organising data in pictorial form | ● angles and sides. For example- scalene, isosceles or equilateral on the basis of sides, etc.
● classifies quadrilaterals into different groups/types on the basis of their sides/angles.
● identifies various (3-D) objects like spheres, cubes, cuboids, cylinders, and cones from the surroundings with the help of examples from surroundings.
● describes and provides examples of edges, vertices and faces of 3-D objects.
● finds out the perimeter and area of rectangular objects in the surroundings like floor of the classroom, surfaces of a chalk box, etc.
● arranges given/collected information such as expenditure on different items ina family in the last six months, in the form of table, pictograph and bar graph and interprets them. |

Class VII (Mathematics)

Suggested Pedagogical Processes	Learning Outcomes
The learner may be provided opportunities in pairs/groups/ individually and encouraged to: ➢ provide contexts for exploring the rules of multiplication and division of integers. This can be done through number line or number patterns. For example : 3x2=6 3x1=3 3x0=0 3x(-1)=0 3x(-2)= -6	**The learner:** ● multiplies/divides two integers. ● nterprets the division and multiplication of fractions. for example, interprets $\frac{2}{3} \times \frac{4}{5}$ as $\frac{2}{3}$ of $\frac{4}{5}$. Also $\frac{1}{2} \div \frac{1}{4}$ is interpreted as how many make? $\frac{1}{4} \frac{1}{2}$ ● uses algorithms to multiply and divide fractions/decimals. ● solves problems related to daily life situations involving rational numbers.

Same reduce by
Numbers three
numbers
reduce by one numbers
So 3x(-3)= -9
means a positive integer multiplied
by a negative integer given a negative
integer *For example:

(a) $\frac{1}{4} \times \frac{1}{2}$ is $\frac{1}{4}$ of $\frac{1}{2}$ is $\frac{1}{8}$ (b) $\frac{1}{2} \div \frac{1}{4}$ means number

of $\frac{1}{4}$ in $\frac{1}{2}$ are two

- ➢ explore the multiplication/ division of fractions/decimals through pictures/paper folding activities /daily life examples
- ➢ discuss the situations that require the $\frac{1}{2}$ use of fractional numbers in opposite direction, such as moving 10 m to the right of a tree and 15 $\frac{2}{3}$ m to its left etc.
- ➢ involve children in exploring how repeated multiplication of numbers can be expressed in short form. For example 2×2×2×2×2×2= can be expressed as 26.
- ➢ explore the possible combinations of variables and constants using different operations to form algebraic expressions in various contexts.
- ➢ provide situations from daily life that lead to setting up of equations and choosing the appreciate value of the variable that equate both sides.
- ➢ conduct activity of adding /subtracting number of objects of same category from daily life. For example number of notebooks obtained when 3 notebooks are added to a group of 5 notebooks
- ➢ discussion can be held to evolve the understanding of the concepts of ratios and percentage (equality of ratio.)
- ➢ provide daily life situations based on profit/loss and simple interest thatshow the use of percentage.
- ➢ explore different examples from daily life in which pair of angles are involved with a common vertex. (Scissors, Road Junction, Letter X, T, etc).

- ● uses the exponential form of numbers to simplify problems involving multiplication and division of large numbers.
- ● represents daily life situations in the form of a simple equation and solves it
- ● adds/subtracts algebraic expressions
- ● distinguishes quantities that are in proportion. For example, tells that 15,45,40,120 are in proportion as 15/45 is the same as 40/120.
- ● solves problems related to conversion of percentage to fraction and decimal and vice versa.
- ● calculates profit/loss percent and rate percent in simple interest.
- ● classifies pairs of angles based on their properties as linear, supplementary, complementary, adjacent and vertically opposite and finds value of the one when the other is given.
- ● verifies the properties of various pairs of angles formed when a transversal cuts two lines. • finds unknown angle of a triangle when its two angles are known.
- ● explains congruency of triangles on the basis of the information given about them like (SSS, SAS, ASA, RHS)
- ● using ruler and a pair of compasses constructs, a line parallel to a given line from a point outside it and triangles.
- ● finds out approximate area of closed shapes by using unit square grid/ graph sheet.
- ● calculates areas of the regions enclosed in a rectangle and a square.
- ● finds various representative values for simple data from her/his daily life contexts like mean, median and mode.
- ● recognises variability in real-life situation such as, variations in the height of students in her class and uncertainty in happening of events like throwing a coin.
- ● interprets data using bar graph such as consumption of electricity is more in winters than summer, runs scored by a team in first 10 overs etc.

➢ verify the properties of various pairs of angles by drawing a diagram (One group can give the measure of other angle) ➢ visualise the relationship between various pairs of angles when `a transversal cuts two lines (parallel and non-parallel), angles of triangle and relationship among its sides through diagrams and upper primary mathematics kit (developed by NCERT). ➢ draw different types of triangles, ask them to measure angles of all triangles, and verify. ➢ explore exterior angle property of triangles; and Pythagoras theorem. ➢ identify symmetrical figures from their environment which shows rotational symmetry. ➢ visualise the symmetry through paper folding activities. ➢ establishing congruence criterion and later on verifying the property with the help of by superimposing one above the other. ➢ demonstrate the construction of a line parallel to the given line from a point outside it through students' active participation. ➢ construct the simple triangle by using a ruler and compasses. ➢ cut out different closed figures drawn on hard boards/ thick papers. Trace the figures in the given graph sheets. ➢ count the exact number of square units occupied by the traced figure (Complete, Half, etc). and find out the approximate area of these figures. ➢ through discussion motivate them to arrive at the formula for the area of a rectangle/square. ➢ find a representative value of data i.e. mean, mode or median of ungrouped data. Encourage them to arrange it in a tabular form and represent it by bar graphs. ➢ draw inferences for future events from the existing data. ➢ discuss the situations where the term „chance‟ can be used, for example, what are the chances of rainy today as chances of getting & while rolling dice. ➢ sum of two sides of a triangle is greater than the third side.	