

LEARNING INDICATORS UP TO CLASS III

Curricular Expectations:

During the learning of mathematics from class I to III child is expected to:

- Count and understand numeration system
- Learn conventions needed for mastery of mathematical techniques such as the use of a base ten system to represent numbers
- Perform simple computations in her/his own ways up to three digit numbers and apply these to their day to life activities in different contexts
- Understand and use standard algorithms to perform operations of addition, subtraction, multiplication and division on numbers up to three digits
- Learn vocabulary of relational words to extend her/his understanding of space and spatial objects
- Identify and extend simple patterns starting from repeating shapes to patterns in numbers
- Collect, represent and interpret simple data/information in her/his daily life activities

CLASS I

| Conceptual Area | Pedagogical Processes | Learning Indicators |
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| <p>SHAPES AND SPATIAL UNDERSTANDING</p> <p>Familiarity with spatial relationships like top- bottom; on-under; inside- outside; etc.</p> | <ul style="list-style-type: none"> • Interaction is to be done with children on introducing the new vocabulary of spatial terms, for example, telling small stories/poems having the vocabulary related to spatial terms with lot of interaction with the children. Utilizing child’s experiences outside the classroom • Games within groups of children to find hidden treasure by providing clues in spatial terms like on the top of the table but below the book, fish inside the jar etc. | <ul style="list-style-type: none"> • Displays understanding of spatial relationships (top- bottom, inside- outside; above- below; big- small; near- far; thin- thick; before-after; above- below etc.) in given surroundings/situations and uses vocabulary for describing . |
| <p>NUMBERS AND NUMBER</p> | <ul style="list-style-type: none"> • Engaging children in activities targeted to | <ul style="list-style-type: none"> • Devises ways of collecting and counting the given |

| Conceptual Area | Pedagogical Processes | Learning Indicators |
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| <p>OPERATIONS</p> <p>Counts, Recognizes, Reads and writes numerals for numbers up to 99</p> <p>Adds and subtracts single digit numbers</p> | <p>manipulation of concrete objects (locally available) to develop pre number concepts like sorting, classification, sequencing and one- to-one correspondence.</p> <ul style="list-style-type: none"> • Involving children in reading numbers written on a number chart and other places in and outside classroom • Activities and games aimed at associating a spoken or written number with appropriate number of objects, drawn from a collection. • Organise group activities to compare number of objects in two collections by one-to-one correspondence. Children should be encouraged to find their own ways of comparing the collections e.g. using the sequential order of numbers. | <p>number of objects like pebbles, seeds, leaves, etc from her immediate environment and expresses the number as per her own understanding.</p> <ul style="list-style-type: none"> • Attempts to read and write any given number (up to 99) and associate a given collection with a number and vice-versa. • Demonstrates strategies of comparing two numbers e.g. matching one to one, using sequential order of numbers, using size of a number etc. • Describes ways of combining two collections to find the sum of numbers • Demonstrates her ways of finding difference between two numbers |
| <p>Solves problems using Addition and Subtraction of single digit numbers</p> | <ul style="list-style-type: none"> • Involve children in reading given problems and discussing what is given, what is to be found. Let children work out their strategies to find the unknown from the known. | <ul style="list-style-type: none"> • Analyses and describes simple contextual problem in mathematical terms and finds the given and unknown data. • Finds the strategies to reach unknown from the known • Solves problems using addition and/or subtraction |
| <p>Basic idea of multiplication</p> <p>Understands concept of division</p> | <ul style="list-style-type: none"> • Creating situations and context where a number is to added repeatedly like 2 cookies to be given to each of 4 friends, etc. | <ul style="list-style-type: none"> • Shows difficulty in expressing repeated addition and appreciates the use of multiplication for repeated addition |

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| | <ul style="list-style-type: none"> • Encouraging children to discover some other method of writing repeated addition • Providing small hints to reach to the situation where child says $2+2+2+2$ can also be called as 4 times 2. • Activities to develop multiplication facts (times tables) by repeated addition and later on by observing patterns • Creating situations of equal sharing/grouping of objects and exploring ways of describing it in mathematical way. | <ul style="list-style-type: none"> • Explores the multiplication facts of 2,3,4 and 5 by different ways like repeated addition, skip counting, identifying and continuing pattern • Explores ways of equal grouping /sharing /distribution |
| <p>Money</p> <p>Identifies currency notes and coins</p> | <ul style="list-style-type: none"> • Using child’s vocabulary and understanding about money from home and out of school experiences. • Involving children in groups and/or individually to make play currency notes of different denominations. A set of such actual notes can be shown to them for the activities. • Creating simple selling and buying situations in classroom and let children play with their play money. | <ul style="list-style-type: none"> • Demonstrates use of numbers in identifying and making currency notes of different denominations • Attempts to make small amounts of money by using notes of different denominations in different ways |
| <p>Measurement:</p> | <ul style="list-style-type: none"> • Organising discussions among children focusing on need o measure various things including | <ul style="list-style-type: none"> • Describes and justifies length and distances of common objects in her own language |

| Conceptual Area | Pedagogical Processes | Learning Indicators |
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| Idea of length and distance | <p>lengths and distances and other quantities</p> <ul style="list-style-type: none"> • Providing hints during discussions so that children can appreciate that a unit is required for measuring anything. • Creating situations when children get opportunities to measure in their own ways and resolve conflicts, if any, aroused due to use of non uniform units. • Involving children in devising various units that can remove the confusion and be used by all in a particular context. • Encouraging children to make out their meaning about the standard units of measurement they have in their vocabulary like a liter of water, kilogram, meter, kilometer etc. | <ul style="list-style-type: none"> • Attempts to resolve conflicts on lengths/distances by using body parts like hand span etc.(non standard units). • Devises ways of making uniform units for measuring length/distances. • Uses her vocabulary to appreciate meter as a standard (uniform) unit of length. • Demonstrates ways of measuring smaller distances using a meter scale • Appreciates the division of one meter into centimeters to measure relatively smaller lengths |
| <p>Mass</p> <p>Weighs objects using non-standard units</p> <p>Appreciates need for standard unit of measuring marks</p> | | <ul style="list-style-type: none"> • Describes ways of comparing and quantifying mass(es) of common objects • Uses simple balance to compare weights of common objects • Uses non-standard units like small stones and other such objects available in child's vicinity • Understands that objects with different shapes and sizes may have same weights. |

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| <p>Volume</p> <p>Idea of more/less capacity of different containers</p> | | <ul style="list-style-type: none"> • Estimates capacities of different containers and tries to order them as per their capacities • Shows the ability to compare the capacities of different containers in terms of non-standard units (like mugs, spoons etc.) |
| <p>Time</p> <p>Gets familiar with the days of the week and months of the year</p> | <ul style="list-style-type: none"> • Organising discussions and short stories on the vocabulary children have about time and calendar • Creating situations where children are encouraged to describe their experiences in terms of daily routine activities like from waking up in morning till sleeping in the night. | <ul style="list-style-type: none"> • Attempts to narrate the activities of a day in sequence, distinguishing time of events using her own vocabulary for earlier and later • Shows the understanding of shorter and longer duration of different activities performed or to be performed • Describes he names of days of a week and months in a year |
| <p>Data Handing</p> <p>Collects, represents and interprets simple data</p> | <ul style="list-style-type: none"> • Organising activities and providing opportunities to record information in numbers and to draw inferences or make decisions out of it. For example, in organizing a New Year party, how many pieces of different types would be required for class de coration. | <ul style="list-style-type: none"> • Attempts to record information in her own ways. • Participates in discussions with others to draw inferences from the recorded information |

CLASS II

| Conceptual Area | Pedagogical Processes | Learning Indicators |
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| <p>SHAPES AND SPATIAL UNDERSTANDING</p> | <ul style="list-style-type: none"> • Conduct plays and games with children on identification and classification of shapes around | <ul style="list-style-type: none"> • Displays understanding of 3-D shapes around her in terms of their physical properties |

| Conceptual Area | Pedagogical Processes | Learning Indicators |
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| Classifies shapes on the basis of their properties . | them like round that role, slide that are sliding etc. | |
| Sorts, classifies and describes 2-D and 3-D shapes | <ul style="list-style-type: none"> • Discussing various shapes (2-D and 3-D) available in the surroundings of the child and their characteristics by involving children in identification of the specific characteristics of every shape. • Conducting individual and group activities on sorting things from a given collection of objects (from NCERT mathematics kit, if available in the school or taking things from the child’s vicinity). The sorting can be done on the basis of observable properties like color, shapes or size, taking one at a time. • Drawing child’s attention towards various similarities and differences in two and three dimensional shapes while they are sorting and classifying them. This will help them in associating various shapes with names like squares, rectangles, triangles, cube, cuboids, cone, cylinder, sphere etc. | <ul style="list-style-type: none"> • Shows understanding by naming 2-D shapes like square, rectangle, triangle and circle and also discovers their observable properties. • Indicates understanding of 2-D shapes on the basis of number of sides, corners and diagonals, straight and curved edges etc. • Demonstrates shapes like book, glass, bottle, chalk box, ball as 3-D shapes and gradually attempts to associate them with standard names like cuboids, sphere, cone, cylinder • Explores observable properties of 3-D shapes like flat and curved surface, edges, corners etc. • Groups objects on the basis of shapes (cones, cylinder, cubes, balls etc.) and other observable properties. • Demonstrates her ability to differentiate between 2-D shapes (like square, rectangle etc.) and 3-D shapes (cone, cylinder, sphere etc.) |
| Understands the concept of straight and curved lines | <ul style="list-style-type: none"> • Child sees lot of straight lines in their surrounding. Conduct group activities to classify lines as sleeping (horizontal) , slanting (oblique) and standing (vertical) lines. Child actually draws such lines in their drawings • Giving idea of straightness and curvedness from the objects like edge of a tumbler, edge of a | <ul style="list-style-type: none"> • Classifies lines as slanting, sleeping and standing • Cites different examples to show the understanding of difference between straight and curved lines • Make free hand drawing of horizontal, vertical and slant lines. |

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| | <p>book/notebook, table etc.</p> <ul style="list-style-type: none"> • Conducting activities involving children in drawing straight and non straight lines by tracing the edge on paper. • Engaging children in making sceneries, pictures and drawings, focusing on shapes made up of straight and curved lines | |
| <p>NUMBERS AND NUMBER OPERATIONS</p> <p>Counts, Recognizes, Reads and writes numerals for numbers up to 99</p> | <ul style="list-style-type: none"> • Involving children in reading numbers written on a number chart and other places in and outside classroom • Activities and games aimed at associating a spoken or written number with appropriate number of objects, drawn from a collection may be organized in groups of tens and ones • Organise group activities to compare number of objects in two collections by one-to-one correspondence. Children should be encouraged to find their own ways of comparing two numbers e.g. using the sequential order of numbers, number of tens and ones in them etc. | <ul style="list-style-type: none"> • Attempts to read and write any given number (up to 99) and associate a given collection (arranged in tens and ones) with a number and vice-versa. • Demonstrates strategies of comparing two numbers e.g. matching one to one, using sequential order of numbers, using size of a number etc. |
| <p>Understands place and face value of digits in a number.</p> <p>Understands zero as a place</p> | <ul style="list-style-type: none"> • Engaging child in activities of counting large number of objects from her surroundings. Encourage them to make equal groups while counting. After building an adequate understanding of grouping | <ul style="list-style-type: none"> • Appreciates the place value system as a system of grouping objects while counting • Describes her understanding about value of digits in a |

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| <p>holder and as a number</p> <p>Recognizes patterns in numbers and shapes</p> | <p>objects in tens and ones, involve them in writing the number.</p> <ul style="list-style-type: none"> • Conducting group activities in the class so that children are involved in breaking a number in tens and ones like in 17 the digit 1 shows 10 so $17=10+7$; 20 has two tens and the no units. | <p>given number.</p> <ul style="list-style-type: none"> • Devises ways of writing a number when a group (tens or ones) is missing. • Answers question like what happens when a number is subtracted from itself? When some items are consumed one after the other, how many are left when last is also consumed? • Child attempts to show that zero is the number representing absence of some item in a group. • Writes a number in expanded form in her own ways like 53 can be $50+3$ or $3+50$ or $40+10+3$ etc. |
| <p>Adds and subtracts two digit numbers (with and without regrouping)</p> | <ul style="list-style-type: none"> • Engaging child in exploring the situations where addition and subtraction of numbers is required like, combining two groups, enlarging a given group by adding some more items etc. • There are a lot of situations in child's daily life where addition of numbers is happens. Involve them in activities and problem solving on addition and subtraction of numbers • Conduct discussion with children so that they | <ul style="list-style-type: none"> • Devises her own ways to add two 2-digit numbers. Later on uses algorithms for addition of numbers • Develops her strategies to add and/or subtract a numbers from a two digit number. • Uses different algorithms to add and subtract numbers • Adds and subtracts two digit numbers in daily life situations |

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| | <p>explore their own ways of addition and subtraction and should be able to develop their algorithms. Avoid unnecessary emphasis on mechanical application of standard algorithms for these operations.</p> <ul style="list-style-type: none"> • Creating situations where children can use alternative algorithms to find sum and difference. • | |
| <p>Solves problems involving Addition and Subtractions of two digit numbers</p> | <ul style="list-style-type: none"> • Involve children in reading given problems and discussing what is given, what is to be found. Let children work out their strategies to find the unknown from the known. • Creating situations where addition and/or subtraction of two digit numbers is involved in solving a problem. • Organising selling buying situation in classroom where lot of addition and subtraction of money is involved. • Encouraging children to use alternative strategies for finding total and balance without using pen and paper. <ul style="list-style-type: none"> • Encourage children to develop questions/problems on addition and subtraction of two digit numbers. Game can be played within groups of children where in | <ul style="list-style-type: none"> • Analyses and describes a problem involving addition and/or subtraction in terms of mathematical terms and finds the given and unknown data. • Finds the strategies to reach unknown from the known • Solves problems using addition and/or subtraction with and without regrouping. • Uses estimation in verification of sum and difference of two digit numbers • Poses meaningful problems and solves them. |

| Conceptual Area | Pedagogical Processes | Learning Indicators |
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| | <p>one group designs questions and the other group solves the questions/ problems.</p> | |
| <p>Multiplies two numbers</p> <p>Understands concept of division</p> <p>Applies multiplication and/or division to solve conceptual (daily life) problems</p> | <ul style="list-style-type: none"> • Creating situations and context where a number is to be added repeatedly like there are five rows and in each row six children are seating ; 2 cookies to be given to each of 7 friends, etc. • Activities to write multiplication facts (times tables) by repeated addition and later on by observing patterns • Activities to explore ways of multiplying two digit numbers. Avoid telling the standard algorithm at the first instance. Children may devise their ways of multiplying first the tens and then units or other creative ways. • Solving large problems on multiplication to master different algorithms and strategies. • Creating situations of equal sharing/grouping of objects and exploring ways of describing it in mathematical way. • Involving children in discovering their own ways to solve a problem involving division of two digit numbers | <ul style="list-style-type: none"> • Shows difficulty in expressing repeated addition and appreciates the use of multiplication for repeated addition • Explores the multiplication facts of 2,3,4 and 5 by different ways like repeated addition, skip counting, identifying, and continuing pattern • Develops different algorithms to multiply two digit numbers • Explores ways of equal grouping /sharing/ distribution • Understands division as another way of equal grouping /sharing /distribution • Performs division of a single digit/ double digit number by one digit number by grouping / using multiplication tables |

| Conceptual Area | Pedagogical Processes | Learning Indicators |
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| <p>Money</p> <p>Identifies currency notes and coins</p> <p>Puts together amounts of money not exceeding Rs. 50</p> <p>Adds and subtract small amount of money mentally</p> <p>Transacts an amount using 3-4 notes</p> | <ul style="list-style-type: none"> • Using child’s vocabulary and understanding about money from home and out of school experiences initiate discussion on they transact money to purchase things • Involving children in groups and/or individually to make play currency notes of different denominations. A set of such actual notes can be shown to them for the activities. • Creating simple selling and buying situations in classroom and let children play with their play money. • Providing small hints to solve situations of transacting money and finding balances • Encouraging children to make estimates of how much money required, what will left etc. and then to actually verify their estimates. Discussions may be held within and across the groups to find out the ways to refine their estimates. • Encouraging children to be critical observers of money transactions while they accompany parents and others for shopping. | <ul style="list-style-type: none"> • Demonstrates use of numbers in identifying and making currency notes of different denominations • Appreciates the use of money in day-to-day buying and selling situations • Attempts to make small amounts of money by using 3-4 notes of different denominations in different ways • Describe ways to find balance amount out of a given amount after the purchase of about 50 rupees • Estimates/approximates the money required and money obtained in balance in simple buying situations. |
| <p>Measurement: Length</p> <p>Measures lengths and distances</p> | <ul style="list-style-type: none"> • Organising discussions among children to showcase their understanding about measuring various things including lengths and distances and other quantities | <ul style="list-style-type: none"> • Describes and justifies length and distances of common objects in her own language • Attempts to resolve conflicts on lengths/distances by |

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| <p>Relates centimeters and meters</p> | <ul style="list-style-type: none"> • Providing hints during discussions so that children can appreciate that a unit is required for measuring anything. • Creating situations when children get opportunities to measure in their own ways and resolve conflicts, if any, aroused due to use of non uniform units. • Involving children in devising various units that can remove the confusion and be used by all in a particular context. • Encouraging children to make out their meaning about the standard units of measurement they have in their vocabulary like a liter of water, kilogram, meter, kilometer etc. | <ul style="list-style-type: none"> using body parts like hand span etc.(non standard units). • Devises ways of making uniform units for measuring length/distances. • Uses her vocabulary to appreciate meter as a standard (uniform) unit of length. • Demonstrates ways of measuring smaller distances using a meter scale • Appreciates the division of one meter into centimeters to measure relatively smaller lengths |
| <p>Mass</p> <p>Weighs objects using non-standard units</p> <p>Appreciates need for standard unit of measuring marks</p> | <ul style="list-style-type: none"> • Conducting activities within classroom so that children get opportunity to compare the amount of liquid two or more containers have and then arranges these containers in ascending or descending orders of their capacities. | <ul style="list-style-type: none"> • Describes ways of comparing and quantifying mass(es) of common objects • Designs and uses simple balance to compare weights of common objects • Uses non-standard units like small stones and other such objects available in child’s vicinity to measure mass/weight of small objects. • Understands that objects with different shapes and sizes may have same weights. |

| Conceptual Area | Pedagogical Processes | Learning Indicators |
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| <p>Volume</p> <p>Measures and compares the capacity of different containers using non-standard units</p> | | <ul style="list-style-type: none"> • Estimates capacities of different containers and tries to order them as per their capacities • Shows the ability to compare the capacities of different containers in terms of non-standard units (like mugs, spoons etc.) |
| <p>Time</p> <p>Gets familiar with the days of the week and months of the year</p> <p>Gets a feel for sequence of seasons varying locally.</p> <p>Sequences the events occurring over longer periods in terms of dates/days</p> | <ul style="list-style-type: none"> • Organising discussions and short stories on the vocabulary children have about days in a week and names of months • Creating situations where children are encouraged to describe their experiences in terms of daily routine activities like from waking up in morning till sleeping in the night. • Encourage children to tell the time elapsed, time required to complete a task etc. in terms of their own units like number of claps, | <ul style="list-style-type: none"> • Attempts to narrate the activities of a day in sequence, distinguishing time of events using her own vocabulary for earlier and later • Shows the understanding of shorter and longer duration of different activities performed or to be performed • Uses her experiences and talk of the people around him to express sequence of seasons in her own situation/environment |

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| <p>Data Handling</p> <p>Collects, represents and interprets simple data</p> | <ul style="list-style-type: none"> • Organising activities and providing opportunities to record information in numbers and to draw inferences or make decisions out of it. For example, in organizing a New Year party, how many pieces of different types would be required for class decoration? • Involving children in discussion to highlight the importance of recording of information • Creating situations such that child uses her ways to record and present the information in a meaningful manner. • Giving opportunities to children for exploring ways of recording and presenting data and draw inferences from the data. | <ul style="list-style-type: none"> • Attempts to record information in her own ways like number of different types of fruits required the picnic day • Participates in discussions with others to draw inferences from the recorded information • Devises ways to present the recorded information in such a way that its interpretation can be made simpler |
| <p>Patterns</p> <p>Observes and extends patterns in sequence of shapes and numbers</p> <p>Identifies patterns</p> <p>Creates simple patterns by stamping, thumbprints, leaf prints etc.</p> | <ul style="list-style-type: none"> • In all learning of mathematics recognition and extension of patterns is essentially required and used. However, children come across with many interesting patterns in daily life experiences. These are required to be recorded and interpreted. | <ul style="list-style-type: none"> • Identifies simple patterns right from school activities to home like pattern in coming to school to going back, patterns in numbers and shapes, patters in tiles and designs, etc. |

CLASS III

| Conceptual Area | Pedagogical Processes | Learning Indicators |
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| <p>SHAPES AND SPATIAL UNDERSTANDING</p> <ul style="list-style-type: none"> • Creates shapes through paper folding, paper cutting • Identifies 2-D shapes • Describing the various 2-D shapes by counting their sides, corners and diagonals • Draw some 3-D objects • Make shapes on the dot-grid using straight and curved lines • Tiles a given region using a tile of a given shape • Distinguishes between shapes that tile and that do not tile | <ul style="list-style-type: none"> • Conduct activities with individual child and group of 3-4 children for folding paper for more than two types. Let the children discuss and identify the figures that are formed by the crease on opening the paper. • Discussing various shapes (2-D and 3-D) available in the surroundings of the child and their characteristics by involving children in identification of the specific characteristics of every shape. • Drawing child’s attention towards various similarities and differences in two and three dimensional shapes while they are sorting and classifying them. This will help them in associating various shapes with names like squares, rectangles, triangles, cube, cuboids, cone, cylinder, sphere etc. • Giving idea of straightness and curvedness from the objects like edge of a tumbler, edge of a book/notebook, table etc. involve children in exploring the other properties of shapes like edges, corners etc. • Conducting activities involving children in drawing straight and non straight lines | <ul style="list-style-type: none"> • Child identifies rectangles, triangles and other rectilinear shapes formed by the crease of paper on folding it. • Indicates understanding of 2-D shapes on the basis of number of sides, corners and diagonals, straight and curved edges etc. • Demonstrates shapes like book, glass, bottle, chalk box, ball as 3-D shapes and gradually attempts to associate them with standard names like cuboids, sphere, cone, cylinder • Explores observable properties of 3-D shapes like flat and curved surface, edges, corners etc. • Groups objects on the basis of shapes (cone, cylinder, balls etc. as they have curved surface) and other observable properties. • Demonstrates her ability to differentiate between 2-D shapes (like square, rectangle etc.) and 3-D shapes (cone, cylinder, sphere etc.) • Uses different ways of drawing straight line by paper folding, straight edge, straight string with free hand and with free ruler. • Cites different examples to show the understanding of difference between straight and curved lines. • Make free hand drawing of horizontal, vertical and slant lines. • Draws shapes of her liking by using straight and |

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| | <p>by tracing the edge of a 3-D shape on paper.</p> <ul style="list-style-type: none"> • Engaging children in making sceneries, pictures and drawings, focusing on shapes made up of straight and curved lines • Conducting activities with children to draw various shapes using a dot grid. | <p>curved lines on a dot grid</p> |
| <p>NUMBERS AND NUMBER OPERATIONS</p> <p>Reads and write 3-digit numbers</p> <p>Expands a number using place value</p> <p>Counts in different ways- starting from any number</p> <p>Compares numbers</p> <p>Forms greatest and smallest up to three digit numbers using given digits</p> | <ul style="list-style-type: none"> • Involving children in reading numbers written on a number chart and other places in and outside classroom • Engaging child in activities of counting large number of objects from her surroundings. Encourage them to make equal groups while counting. After building an adequate understanding of grouping objects in hundreds, tens and ones, involve them in writing the number. • Organise group activities to compare number of objects in two collections (having groups of tens and ones) by one-to-one correspondence. Children should be encouraged to find their own ways of comparing the collections e.g. using the sequential order of numbers. | <ul style="list-style-type: none"> • Devises ways of counting the given number of objects by grouping them in groups of 2, 3, 4, .. 10 objects from her immediate environment and expresses the number as per her own understanding. • Attempts to read and write any given number (up to 999) and associate a given collection with a number and vice-versa. • Demonstrates strategies of comparing two numbers using sequential order of numbers, using size of a number, using the place values of digits etc. • Devises ways of writing a number when a group (hundreds, tens or ones) is missing. |
| <p>Addition and subtraction</p> <p>Adds and subtracts three digit</p> | <ul style="list-style-type: none"> • Engaging child in adding and/or | <ul style="list-style-type: none"> • Adds and subtracts 3-digit numbers by using different |

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| <p>numbers (with and without regrouping) Solves problems using Addition and Subtractions</p> | <p>subtracting two numbers written vertically or horizontally. Let the children devise their own ways of addition by using their understanding of addition on 2-digit numbers</p> <ul style="list-style-type: none"> • There are a lot of situations in child's daily life where addition and subtraction of numbers up to three digits happens. Let the child analyse the given situation and solve it by addition and subtraction. • Involve children in reading given problems and discussing what is given, what is to be found. Let children work out their strategies to find the unknown from the known. • Organising selling buying situation in classroom where lot of addition and subtraction of money is involved using play currency notes up to Rs. 1000 • Encouraging children to use alternative strategies for finding total and balance without using pen and paper. | <p>strategies like using the concrete objects in bundles of hundreds, tens and ones or by standard algorithms or by her own algorithm but mathematically correct process.</p> <ul style="list-style-type: none"> • Analyses and describes a problem in mathematical terms and finds the given and unknown data. • Finds the strategies to reach unknown from the known • Solves problems using addition and/or subtraction with and without regrouping. • Uses estimation in verification of sum and difference of two/three digit numbers |
| <p>Multiplication Multiplies two numbers using standard algorithm and lattice multiplication algorithm Understands concept of</p> | <ul style="list-style-type: none"> • Providing small hints to reach to the situation where child says $2+2+2+2+2$ can also be called as 5 times 2. • Activities to write multiplication facts | <ul style="list-style-type: none"> • Appreciates the use of multiplication for repeated addition |

| Conceptual Area | Pedagogical Processes | Learning Indicators |
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| <p>division</p> <p>Applies multiplication and/or division to solve conceptual (daily life) problems</p> | <p>(times tables) by repeated addition and later on by observing patterns</p> <ul style="list-style-type: none"> • Activities to explore ways of multiplying two digit numbers. Avoid telling the standard algorithm at the first instance. Children may devise their ways of multiplying first the tens and then units or other creative ways. • Solving variety of problems on multiplication to master different algorithms and strategies. | <ul style="list-style-type: none"> • Explores the multiplication facts of 2,3,4,5 and 10 by different ways like repeated addition, skip counting, identifying and continuing pattern • Develops different algorithms to multiply two digit numbers • |
| <p>Division</p> <p>Explains the meaning of division from context of equal sharing and grouping</p> <p>Relates division with multiplication</p> <p>Completes division facts by grouping and by using multiplication tables</p> | <ul style="list-style-type: none"> • Creating situations of equal sharing/grouping of objects and exploring ways of describing it mathematically. • Conducting activities to explore division facts in different ways like repeated subtraction, inverse of multiplication, pattern recognition etc. • Involving children in discovering their own ways to solve a problem involving division of two digit numbers • Conducting practice activities to help children master algorithms and appreciate the standard algorithms given | <ul style="list-style-type: none"> • Explores ways of equal grouping /sharing /distribution • Understands division as another way of equal grouping /sharing /distribution • Performs division by grouping / using multiplication tables • Shows her understanding of division of two digit numbers in equal distribution of money to number of persons |

| Conceptual Area | Pedagogical Processes | Learning Indicators |
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| | in books. | |
| <p>Money</p> <p>Converts Rupee to Paise using play money</p> <p>Adds and subtracts amounts using column addition, and subtraction without regrouping</p> <p>Makes rate charts and bills</p> | <ul style="list-style-type: none"> • Involving children in groups and/or individually to make play currency notes of different denominations. A set of such actual notes can be shown to them for the activities. • Creating simple selling and buying situations in classroom and let children play with their play money. • Providing small hints to solve situations of transacting money and finding balances • Encouraging children to make estimates of how much money required, what will left etc. and then to actually verify their estimates. Discussions may be held within and across the groups to find out the ways to refine their estimates. • Encouraging children to be critical observers of money transactions while they accompany parents and others for shopping. | <ul style="list-style-type: none"> • Demonstrates use of numbers in identifying and making currency notes of different denominations • Appreciates the use of money in day-to-day buying and selling situations • Attempts to make small amounts of money by using notes of different denominations in different ways • Describe ways to find balance amount out of a given amount after the purchase of about 100 rupees • Establishes relationship between rupee and paisa • Devises ways of adding and subtracting amounts in daily life activities • Estimates/approximates the money required and money obtained in balance in simple buying situations. |
| <p>Measurement: Length</p> | <ul style="list-style-type: none"> • Organising discussions among children to showcase their understanding about measuring various things including | <ul style="list-style-type: none"> • Attempts to resolve conflicts on lengths/distances by using body parts and other non uniform units like hand span etc.(non standard units). |

| Conceptual Area | Pedagogical Processes | Learning Indicators |
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| <p>Appreciates the need for a standard unit</p> <p>Measures length using appropriate standard units of length by choosing between centimeters and meters</p> <p>Estimate the length of given object in standard units and verifies by measuring</p> <p>Uses a ruler</p> <p>Relates centimeter and meter</p> | <p>lengths and distances and other quantities</p> <ul style="list-style-type: none"> • Creating situations when children get opportunities to measure in their own ways and resolve conflicts, if any, aroused due to use of non uniform units. • Providing hints during discussions so that children can appreciate that a unit is required for measuring anything. • Involving children in devising various units that can remove the confusion and be used by all in a particular context. • Providing children units of centimeter and meter to measure various objects so that children can relate centimeter and meter | <ul style="list-style-type: none"> • Devises ways of making uniform units for measuring length/distances. • Uses her vocabulary to appreciate meter as a standard (uniform) unit of length. • Demonstrates ways of measuring smaller distances using a meter scale • Appreciates the division of one meter into centimeters to measure relatively smaller lengths |
| <p>Mass</p> <p>Weighs objects using non-standard units</p> <p>Appreciates the conservation of weight</p> | <ul style="list-style-type: none"> • Encouraging children to make out their meaning about the standard units of measurement they have in their vocabulary like a liter of water, kilogram and gram etc. • Let the children appreciate sub units to measure smaller and bigger quantities like meter-centimeter, kilogram-gram, litre- millilitre etc. | <ul style="list-style-type: none"> • Describes ways of comparing and quantifying mass(es) of common objects • Uses simple balance to compare weights of common objects • Uses non-standard units like small stones and other such objects available in child's vicinity • Understands that objects with different shapes and sizes may have same weights. |
| <p>Volume</p> <p>Measures and compares the</p> | <ul style="list-style-type: none"> • Involving children in speaking about their own daily experience of measuring liquids and comparing the sizes of | <ul style="list-style-type: none"> • Estimates capacities of different containers and tries to order them as per their capacities • Shows the ability to compare the capacities of |

| Conceptual Area | Pedagogical Processes | Learning Indicators |
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| <p>capacity of different containers using non-standard units</p> <p>Appreciates the conservation of Volume</p> | <p>different containers</p> <ul style="list-style-type: none"> • Providing opportunities to children to relate various units and sub units and use their conversion in solving contextual problems | <p>different containers in terms of non-standard units (like mugs, spoons etc.)</p> <ul style="list-style-type: none"> • Understands general terms of measurement like liter for measuring volume and capacity. • Appreciates the conservation of volume like same amount of liquid seems to be more and less on pouring in to narrow and wide containers respectively but is same in quantity. |
| <p>Time</p> <p>Reads a calendar to find a particular day and date.</p> <p>Reads time correct to the hours</p> <p>Reads calendar to find a particular date and day</p> | <ul style="list-style-type: none"> • Organising discussions and short stories on the vocabulary children have about time and calendar • Encourage children to tell the time elapsed, time required to complete a task etc. • Conducting group/individual activities to introduce the idea of measuring a day in hours, months in days, and year in months. • Providing opportunities for reading a clock and a calendar. • Initiating discussion in the classroom and encourage children to find other ways of measuring a day, month and year. | <ul style="list-style-type: none"> • Shows the understanding of shorter and longer duration of different activities performed or to be performed • Uses her experiences and talk of the people around him to express sequence of seasons in her own situation/environment • Attempts to read the clock and tells the time correct to hour. • Demonstrates the skill of reading the calendar to find a particular day and date i.e finds the day corresponding to date from the calendar. |
| <p>Data Handling</p> <p>Record data using tally marks</p> <p>Collects data and represents in terms of pictograph choosing</p> | <ul style="list-style-type: none"> • Organising activities and providing opportunities to record information in numbers by using tally marks and to draw inferences or make decisions out of it. For example, in organizing a New Year party, how many pieces of different | <ul style="list-style-type: none"> • Attempts to record information in her own ways. • Realizes problems in interpretation of information. • Devises ways of representing information to make it more clear and easy to understand and interpret i.e uses tally marks to record large number of data. • Participates in discussions with others to draw |

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| <p>appropriate scale and unit for display through pictographs</p> <p>Draw conclusions from the data by discussing with the teacher</p> | <p>types would be required for class decoration.</p> <ul style="list-style-type: none"> • Involving children in discussion to highlight the importance of recording of information • Creating situations where in child uses her ways to record and present the information in a meaningful manner like number of students present in days of a week, number of family members each of her friends have, number of children whose name starts with particular letters etc. • Giving opportunities to children for exploring ways of recording and presenting data and draw inferences from the data. | <p>inferences from the recorded information</p> |
| <p>Patterns</p> <p>Identifies simple symmetrical shapes and patterns in his/her surroundings</p> <p>Make patterns and design from straight lines and other geometrical shapes.</p> <p>Identifies patterns in the numerals for odd and even numbers and in adding odd and even numbers.</p> | <ul style="list-style-type: none"> • Involving children in recognition and extension of patterns they come across in daily life experiences. These are required to be recorded and interpreted. For example different number patterns like 2,4,6,..., 10,20,30,40,... and patterns of shapes found on tiles and border designs on sarees, shawls etc. • Organizing group activities where children can create and discuss patterns. Group discussions could be followed by presentation of the patterns that have been found in front of the whole class. | <ul style="list-style-type: none"> • Identifies simple patterns right from school activities to home like pattern in coming to school to going back, patterns in numbers and shapes, patterns in tiles and designs, etc. • Understands the patterns of even and odd numbers, commutative of addition and multiplication of numbers, multiplication of numbers by 1, adding 1 to numbers etc. |

