

PADHE BHARAT  
BADHE BHARAT



# MATHEMATICS LEARNING KIT

User's Manual

For Classes 1 and 2



Early School Mathematics Programme  
Department of Elementary Education  
NCERT, Sri Aurobindo Marg, New Delhi-110016

# Mathematics Learning Kit

## User's Manual

For Classes 1 and 2

विद्यया ऽ मृतमश्नुते



एन सी ई आर टी  
NCERT

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्  
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

# **Imprint Page**

## FOREWORD

A nationwide sub-programme of SSA 'Padhe Bharat Badhe Bharat' has been launched by Govt. of India to emphasise the need to ensure quality in early schooling (classes I and II). The role of early mathematical experiences in influencing later school trajectories is now being well recognized. School mathematics still needs to break away from the tyranny of rote memorization, mastery of mechanical procedures and abstract presentation of concepts. A majority of students inadvertently continue to be excluded and alienated given the domination of such practices. An user's manual is developed with an aim to iterate the need for concrete learning experiences in early mathematics. This user manual has been developed under a special programme on Early School Mathematics by the Department of Elementary Education, NIE, NCERT to supplement/complement the mathematics learning kit developed for classes I and II.

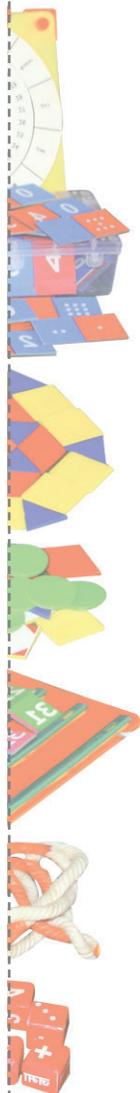
Regular usage of the mathematics learning kit by learners would help not only in developing conceptual clarity on concepts like measurement, numeracy, numberness, data handling, shapes and space but also develop process skills like problem solving, working in a team, creativity, ability to communicate and comprehend the world around us using mathematics.

More often, the usage of such material gets restricted given the apprehension of getting damaged or lost. Care has been taken to ensure the quality of the material from the little children's health point of view like colour hazardousness, sharpness of ends etc. It is believed that when the practice of learning using such material in classroom becomes a routine, children would also gradually learn to take care.

I am thankful to the experts, faculty of NCERT and teachers who helped in development of the Mathematics Learning Kit and its field trialing, that provided useful feedback for the improvement. The efforts of the development team are highly appreciable.

We welcome the comments and suggestions to improve the quality and usability of the Mathematics Learning Kit and its Manual.

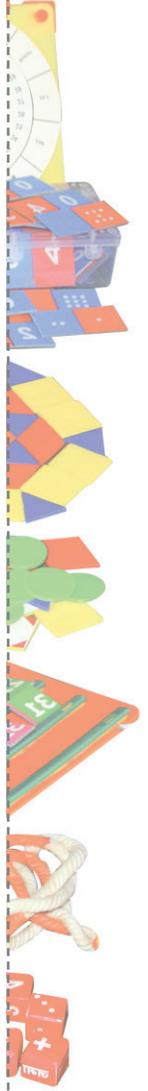
Dr. Hrushikesh Senapaty  
*Director, NCERT*





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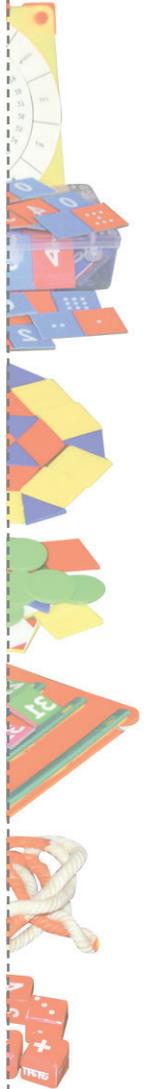
# Introduction

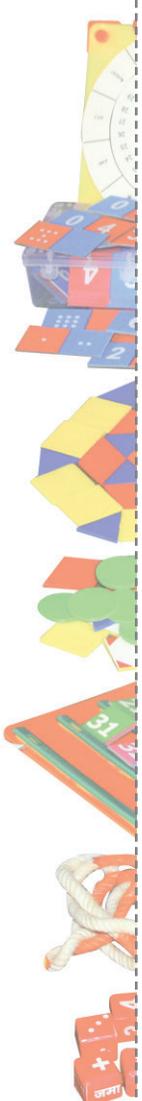
Children's experiences of school must be linked to their life outside the school (NCF-2005). This marks a departure from theoretical and bookish learning. Children need to be provided with meaningful and engaging learning experiences in the school. It is well-known that the children studying in classes I and II, learn and understand better when they are given the opportunity to learn through concrete learning experiences. This will only take place if the children are provided with concrete learning materials.

Keeping in mind the goal of enhancing and enriching the teaching and learning of mathematics in classes I and II, learning materials were conceptualised and developed by the Early School Mathematics Programme (ESMP), Department of Elementary Education, NCERT. Learning materials have been developed with the focus on young learners and has the following features:

- Child friendly and easy to use.
- Encourages free play and exploration.
- Provides learning experiences for key mathematical concepts.
- Enhances understanding of the concepts and reinforces them.

For the effective use of the learning materials, a user's manual has been developed. The activities have been designed according to the learning expectations/outcomes of classes I and II. The segregation of these activities has not been done on the basis of the classes. Suitability of the given activity would depend on the previous learning experiences of the child. For example some times a class I, child can also do activities related to play money while in some cases a child of class II may not be able to estimate the capacity. It is thus strongly suggested that conduct the activities as per the learning experiences the child have had. The manual suggests various activities which can be done with the given items and can facilitate the development of mathematical thinking among young children. For the matter of convenience, the activities in

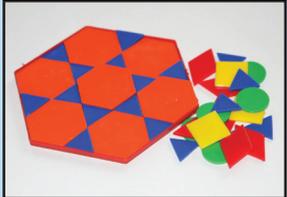


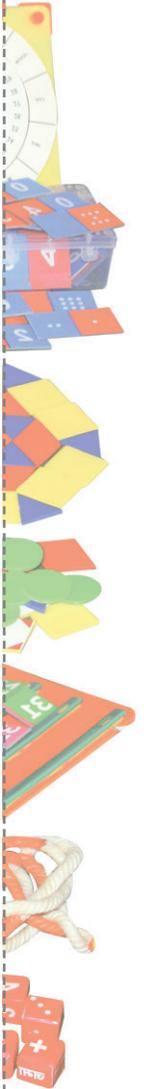


▶ Introduction

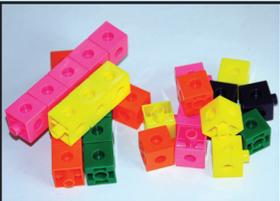
the User's Manual have been organised item wise. The teacher can use or create own activities depending on the theme, learning needs or the social context of the children and make learning of mathematics a joyous experience. Providing this, mathematics learning kit is not intended to discourage the use of locally available materials. It is therefore imperative that the teacher innovates and also uses locally available materials for providing learning experiences to children.

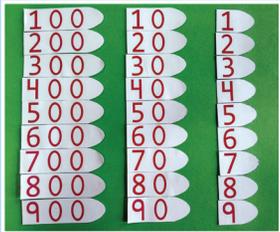
# List of Kit Items

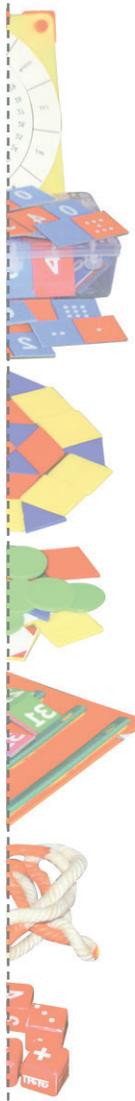
S. No.	Item	Description	Purpose
1.	Solid Shapes (Velcro Models) 	Solids of the following shapes covered with velcro Cube (4) Cuboid (2) Cone (1) Cylinder (4) Disc (4) Sphere (1)	To develop an understanding of 3D shapes and transition from 3D to 2D.
2.	Tiles 	Colored tiles of five colours in three different sizes Squares ( $5 \times 3 = 15$ ) Circles ( $5 \times 3 = 15$ ) Triangles ( $5 \times 3 = 15$ ) Hexagons ( $5 \times 3 = 15$ ) Hexagonal tray (1) Rhombus ( $5 \times 3 = 15$ ) Square tray (1)	To develop an understanding of shapes, space, tessellation and patterns.
3.	Stamping Containers and Stamp Pad 	Hollow plastic 3D shapes and irregular shapes; Cuboidal (2) Cylindrical (1) Prism (1) Irregular shapes (3) Wooden block (1) Stamp pad in 2 colours (1)	To develop an understanding of shapes (transition from 3D to 2D), volume/capacity estimation and making patterns.



▶ List of Kit Items

4.	<p><b>Play Money</b></p> 	<p>Set of currency/coins of the following denominations            ₹ 1 (20 coins)            ₹ 2 (5 coins)            ₹ 5 (4 coins)            ₹ 10 (10 notes)            ₹ 50 (2 notes)            ₹ 100 (1 note)</p>	<p>To develop understanding of place value and strategies for addition and subtraction.</p>
5.	<p><b>Domino Number Cards</b></p> 	<p>Dominoes are rectangular in shape. Each domino is divided into two square parts of different colours with a line in the middle.</p> <p>Each part has a dot on one surface and the corresponding numbers on the other side.</p> <p>Dominoes (54)</p>	<p>To develop number sense and understanding of addition facts (1 to 9)</p>
6.	<p><b>Number Cards</b></p> 	<p>Number cards from 1 to 50 colour coded in different colours.</p>	<p>To develop number sense, understanding of addition, subtraction and number patterns.</p>
7.	<p><b>Blocks</b></p> 	<p>50 detachable cubes in 5 different colours.</p>	<p>To develop number sense and understanding of place value.</p>

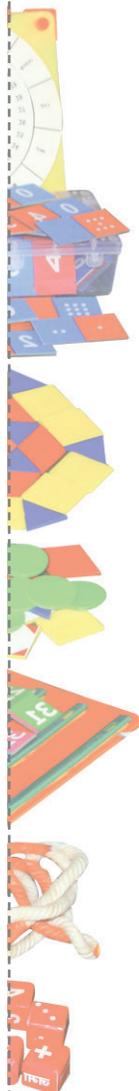
<p>8. Dice</p> 	<p>4 dice each for 0 to 5, 5 to 10, regular dot die and a number operation die (addition and subtraction).</p>	<p>To develop number sense and understanding of addition and subtraction.</p>
<p>9. Place Value Cards</p> 	<p>27 cards (9 each for ones, tens and hundreds) with a curved end to show the direction in which they need to be aligned.</p>	<p>To develop understanding of place value.</p>
<p>10. Clock</p> 	<p>Clock in which children can rotate hour and minute hand to represent time correct to an hour.</p>	<p>To initiate the understanding of the concept of time and reading of clock.</p>
<p>11. String</p> 	<p>A one-meter long string. Children can play various string games.</p>	<p>To initiate the concept of measurement and make the children realise the need for uniform and standard measurement.</p>



## Concepts dealt with the Kit

Concept	Conceptual Structure	Material to be Used	
<b>Number</b>	<ul style="list-style-type: none"> <li>• Classification</li> <li>• Seriation</li> <li>• Number names</li> <li>• Counting</li> <li>• Recognising numbers and numerals</li> <li>• Cardinality</li> <li>• Ordinality</li> <li>• More/less</li> <li>• Forward, reverse and skip count</li> <li>• Grouping</li> <li>• Place value</li> <li>• Concept of '0'</li> </ul>	Blocks, Number cards, Tiles, Domino Number Cards, Place Value Cards, Play Money and Dice.	
<b>Number Operations</b>	<ul style="list-style-type: none"> <li>• Introduction of '0'</li> <li>• Addition as count all</li> <li>• Addition as count on</li> <li>• Addition without carry-over</li> <li>• Addition with carry-over</li> <li>• Introduction of the concept of equality</li> <li>• Introduction of symbols like '=', '+', '-'</li> <li>• Subtraction without borrowing</li> <li>• Subtraction with borrowing</li> </ul>	Place Value Cards, Play Money, Blocks, Tiles, Number Cards, Domino Number Cards and Dice.	
<b>Measurement</b>	<ul style="list-style-type: none"> <li>• Length</li> <li>• Weight</li> <li>• Volume/ Capacity</li> <li>• Time</li> </ul>	<ul style="list-style-type: none"> <li>• Seriation according to size</li> <li>• Using non-standard unit of measurement like arm length, palm length, etc.</li> <li>• Moving from non-standard to standard unit</li> <li>• Creating 'ruler'</li> <li>• Focusing on uniformity of distance between two markings of the ruler</li> </ul>	String, Stamping Containers, Clock, Tiles, Blocks.

	<ul style="list-style-type: none"> <li>• Moving towards standard ‘ruler’</li> <li>• Similar steps as given above are to be followed for weight, volume and time.</li> </ul>	
<b>Patterns</b> <ul style="list-style-type: none"> <li>• Colour patterns</li> <li>• Shape patterns</li> <li>• Number patterns</li> </ul>	<ul style="list-style-type: none"> <li>• Observing patterns</li> <li>• Recognising and describing patterns</li> <li>• Continuing, extending patterns</li> <li>• Creating patterns</li> <li>• Comparing patterns</li> <li>• Reasoning</li> </ul>	Tiles, Stamping Containers, Number Cards, Blocks, Domino Number Cards
<b>Data Handling</b>	<ul style="list-style-type: none"> <li>• Collection of data</li> <li>• Representation of data</li> <li>• Interpretation of data</li> </ul>	Tiles, Stamping Containers, Blocks, Play Money, Solid Shapes.
<b>Shapes</b>	<ul style="list-style-type: none"> <li>• Sorting of 3D objects                             <ul style="list-style-type: none"> <li>– On the basis of appearance</li> <li>– On the basis of their movement</li> <li>– On the basis of their edges and corners</li> </ul> </li> <li>• Classification along with description</li> <li>• Exploration of shapes (3D) in surrounding</li> <li>• Identification of objects in relation to their edges and corners</li> <li>• Tracing 2D outlines using 3D objects</li> <li>• Understanding relationship between 3D and 2D</li> </ul>	Solid Shapes, Tiles, Stamping Containers, Blocks (to make 3D objects) String (to make irregular shapes)



# Suggested Activities

## SOLID SHAPES

### Concepts Dealt

- Solids and their Shapes
- Data Handling

### Activity 1 Let's Explore Solids

**This activity provides learning experiences for:**

- (i) Exploring solids.
- (ii) Developing intuitive understanding of their attributes.

**Type of Activity:** Whole class is divided in groups of 4 children.

### How to Proceed:

- Each group of children is given a set of solids to explore and make any object of their liking using the given solids.



- Encourage children to share about what they have made? How they made it?
- Encourage children to reason out why they have used the given solid for a particular part of the object?
- Invite the children to look at the objects which other groups have made.

### Activity 2 Classify Objects

**This activity provides learning experiences for:**

Classifying objects on the basis of their appearance.

**Type of Activity:** Whole class is divided in groups of 4 children.

**How to Proceed:**

- Ask the children to make two or more different groups using any 10 solids from the available set of solids.
- Meanwhile the teacher can move to different groups and encourage the children to describe or explain how they have classified these objects.



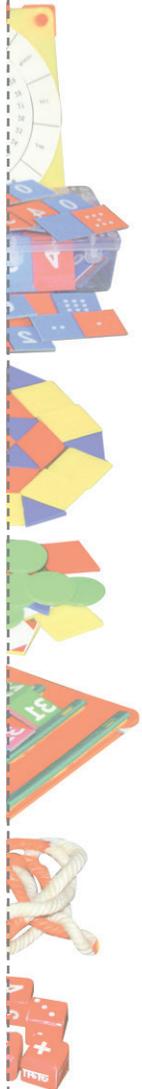
- Teacher can encourage another group to show/explain how they have classified, why they have kept the particular solid in a particular group?
- Ask children to count the solids with them which have similar appearance.
- Ask them to show the group in which there are maximum number of solids.

**Note**  
 In Classes I and II, words such as cube, cuboid and cone are not used. Children can discuss and give their own informal names to solid shapes.

**Activity 3    What Slides? What Rolls?**

**This activity provides learning experiences for:**  
 Associating the property of solids (rolling and sliding) with its surface structure.

**Type of Activity:** To be done individually by each child.



**How to Proceed:**



- Encourage the child to push the solids on a flat surface and explore which solids roll, which slide and which roll from one surface while slides from the other surface.
- A discussion is initiated regarding how these solids can be classified? Encourage the children to classify the solids in categories – slides/rolls/slides and rolls.
- Discussion can be taken forward to let the child explore and classify objects around her/him on the basis of the above classification.
- Encourage the child to reason out why a particular object rolls or slides. The role of plane and curved surface in the movement of objects can be highlighted.

**Activity 4 Make Objects**

**This activity provides learning experiences for:**

Observing and identifying objects around in terms of regular 3D shapes.

**Type of Activity:** Whole class is divided in groups of 4 children.

**How to Proceed:**

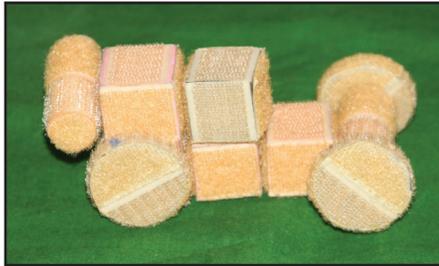
- Children are encouraged to make objects that they see in their day-to-day life by using:  
(a) Two cylinders and one cuboid only



(b) Four cylinders only



(c) Any other solid shapes combination



As children become accustomed to observing objects around them in terms of 3D shapes, the conditions could be made more complex and interesting.

### Activity 5 Draw the Outline

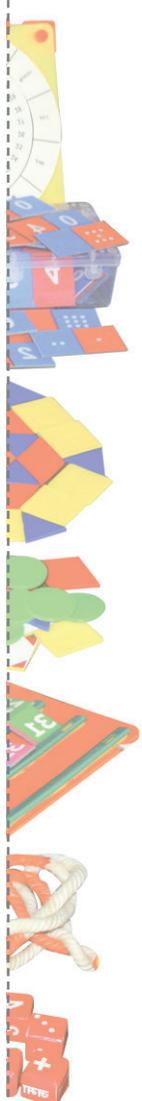
**This activity provides learning experiences for:**

- (i) Encouraging children to see different views of a single object.
- (ii) Exploring the association between an object (3D) and its shape (2D).

**Type of Activity:** To be done individually by each child.

**How to Proceed:**

- Ask the child to trace the boundary of the solids on a paper or slate.
- After tracing all the faces of an object, ask them to view these shapes and observe their similarities and differences with that object.
- Help the child to understand the relationship between 3D objects (solid shapes) and 2D shapes (plane figures).



## Activity 6 Exploring Shapes and Solids

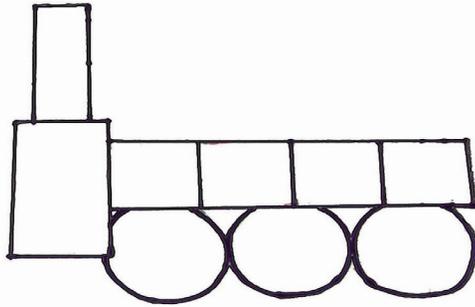
**This activity provides learning experiences for:**

Exploring the association between a shape (2D) and its corresponding (3D) object.

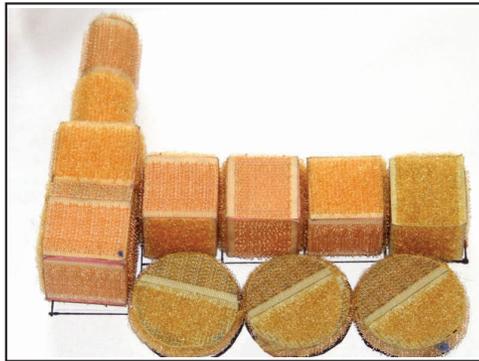
**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Each pair is given some solid shapes and paper sheets on which some objects drawn by tracing the 3D shapes. For example, picture of a train, a joker, a temple, etc.



- Children are encouraged to recreate the given objects by fixing appropriate solids on the traced picture.

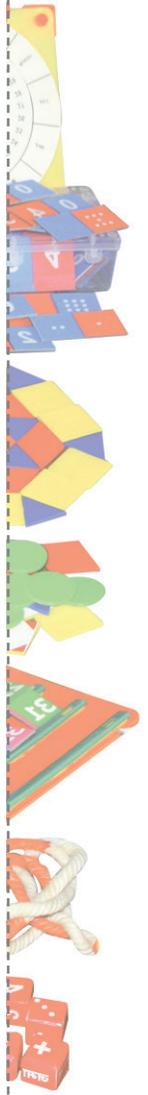


- Encourage children to create their own object and trace them.
- Later the children can be asked to record how many solids of each type has been used while recreating an object.

Solid	How Many?
	
	
	
	

- Teacher can ask the following questions:
  - Which solid has been used more in the given object?
  - Which solid has been used the least in the given object?

**Note**  
Some of the outlines of this activity are given on page 80 also.



## TILES

### Concepts Dealt

- Shapes
- Patterns
- Spatial Understanding and Tessellation
- Estimation
- Data Handling

### Activity 1 Exploring Shapes

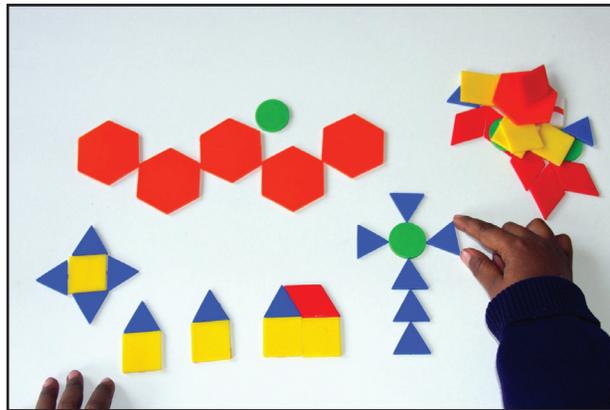
**This activity provides learning experiences for:**

Allowing the child to observe the properties of different 2D shapes.

**Type of Activity:** Whole class is divided in pairs.

#### How to Proceed:

- Ask the children to create a design/object using different tiles.
- Now ask them to record types of tiles which they have used to make it.
- Teacher can further discuss and ask questions like:
  - Why they have used a particular shape to make a flower/home/star?
  - Which shape is used maximum?
  - Which shape is used minimum?



- Teacher can also encourage children to decide a name for each type of tile like *samosa* for a triangle ▲.

## Activity 2 Make Patterns

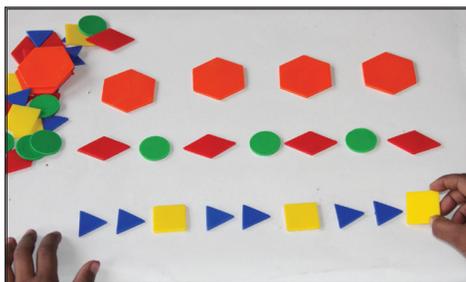
**This activity provides learning experiences for:**

- (i) Enabling the children in making their own patterns.
- (ii) Identifying the repeated unit involved in the making of patterns.

**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Involve the children to create any pattern using different tiles.
- At the initial stage, involve the children to make a pattern using tiles of two shapes only.



- At a later stage, involve the children to create complex patterns.
- Discuss what unit has been repeated to make the particular patterns.

## Activity 3 Arrange Tiles

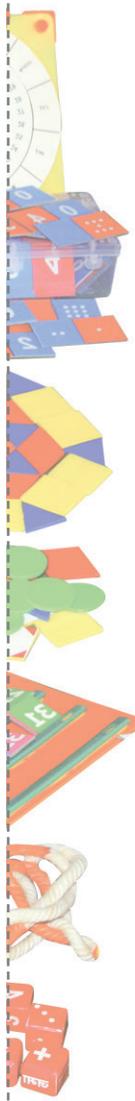
**This activity provides learning experiences for:**

Developing an intuitive understanding of area.

**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Each pair is given a set of tiles.
- Children are given the challenge to choose any type of tiles and arrange the given tiles in the tray so that no gap is left.
- Children are encouraged to share the tiles they have used to fill the tray.
- Now encourage them to talk about how they came to know that this particular piece would fit in the tray or why did they start with that piece only.



## Activity 4 Filling the Tray with Tiles

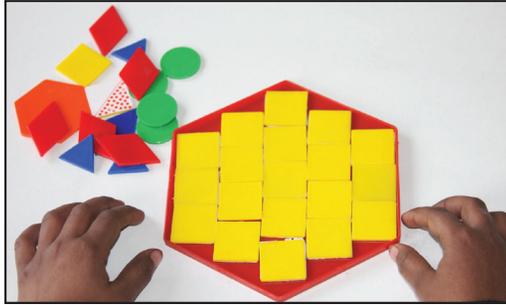
**This activity provides learning experiences for:**

- (i) Exploring the properties of different shapes.
- (ii) Developing an intuitive understanding of area.

**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

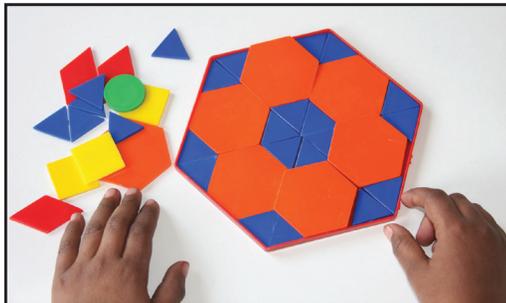
- Ask the children to fill the tray without leaving gaps, under the following conditions:
  - (a) by using only square pieces



- (b) by using only triangular pieces



- (c) by using both hexagonal and triangular pieces





## Activity 6 Pick and Classify

**This activity provides learning experiences for:**  
Strengthening the skill of classification and counting.

**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

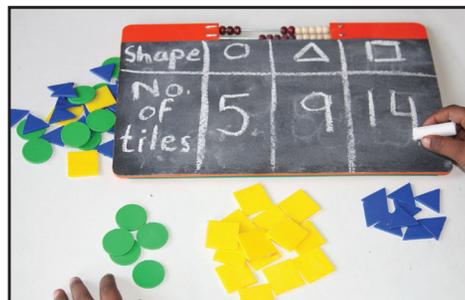
- Encourage children to make the groups of tiles on the basis of colours or shapes.



- After the classification, encourage children to share the attributes on which they have made the groups.
- Children can keep the record of different tiles of different colours, as shown below in the notebook.



- Ask the children to sort the tiles according to other criteria e.g. shapes and record it on the board or notebook.

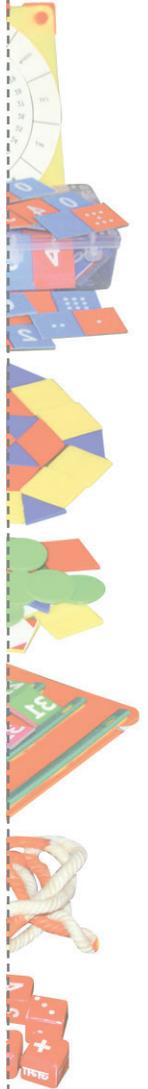


Teacher can ask the following questions:

- Which group has maximum number of tiles?
- Which group has the least number of tiles?

**Extension Activities**

- Teacher may discuss about the sides of each tile.
- The same activity can be repeated by classification on the basis of size.



## STAMPING CONTAINERS

### Concepts Dealt

- Patterns
- Shapes (Transition from 3D to 2D)
- Measurement of Capacity
- Data Handling

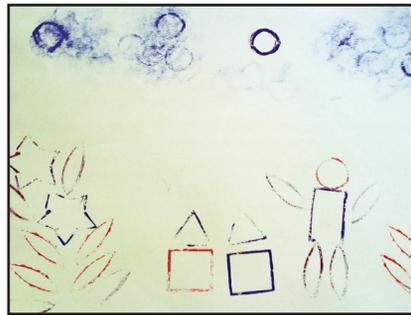
### Activity 1 Generate a Pattern

**This activity provides learning experiences for:**  
Making pattern through stamping.

**Type of Activity:** Whole class is divided in pairs.

#### How to Proceed:

- Each pair is given materials like paper sheet, stamp.
- Ask the children to stamp on a white paper sheet using stamp and stamp-pad.



- Discuss with children about their work.

### Activity 2 Make a Design

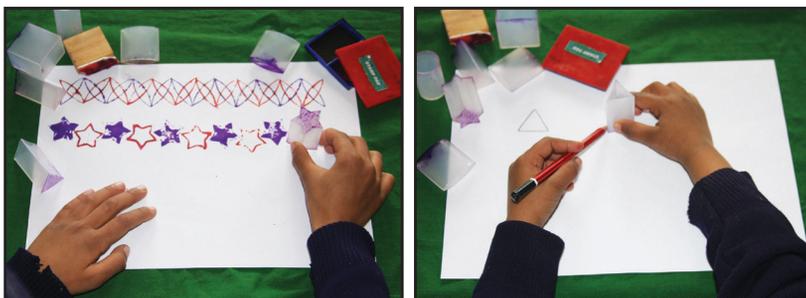
**This activity provides learning experiences for:**  
Recognising and observing designs/patterns present in the surrounding.

**Type of Activity:** Whole class is divided in pairs.

#### How to Proceed:

- Each pair is given materials like paper sheets, stamp and stamp-pad with ink.
- Encourage the children to look for designs present in their immediate environment, e.g., designs on fabrics, tiles, shirts, the window grills, curtains, etc.

- Encourage the children to describe these designs.
- Ask them to create different designs themselves by using stamps.
- Ask them to create similar designs they would like to see on their clothes, tablemats, etc.



- Let the children share their designs with the entire class.
- Draw the attention of the children on the designs that have the idea of repetition and discuss with them how the designs were made.

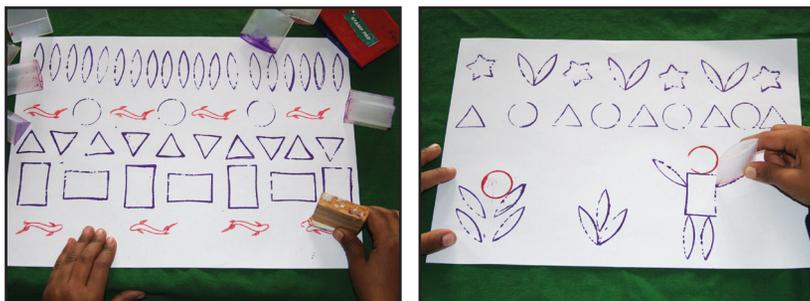
### Activity 3 Extend the Pattern

**This activity provides learning experiences for:**  
Observing and extending patterns.

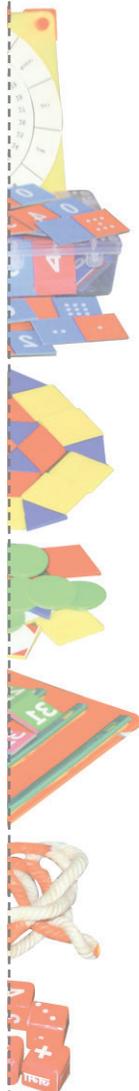
**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Each pair is given materials like paper sheets, stamp and stamp-pad with ink.
- One child has to initiate the pattern/design and challenge the other child to continue it.



- Children keep on changing their roles with each turn.
- Children can be encouraged to increase the complexity of patterns as they move ahead.



## Activity 4 Trace the Boundary

**This activity provides learning experiences for:**

Exploring the relationship between 3D objects and representation of their faces in 2D.

**Type of Activity:** To be done individually by each child.

**How to Proceed:**

- Encourage the child to place the stamp on their notebooks and trace its different faces.
- Now ask question like “How does the stamp looks?” “Is it similar or different from the object used and how?”
- Help the child in understanding the relation between 3D objects and its 2D representation.
- At a later stage, the formal names of all these 2D shapes can be introduced.
- After tracing all the shapes, child can further make interesting pictures using outlines of different shapes or by stamping.

## Activity 5 Lets Estimate the Capacity

**This activity provides learning experiences for:**

Developing estimation of volume/capacity.

**Type of Activity:** To be done individually by each child.

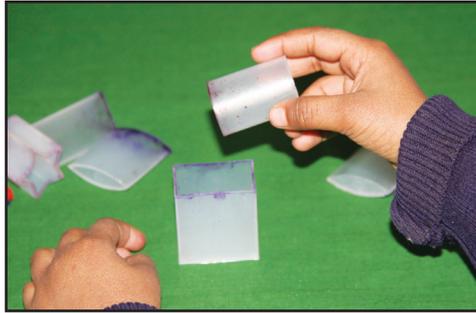
**How to Proceed:**

(A)

- Show the containers to the child and ask her/him which container will hold maximum amount of water.
- Encourage the child to estimate the amount of water (in terms of spoon) each container will have.
- Fill water in a particular container using spoon. Count the number of spoons of water which will fill the containers.

(B)

- Ask the child to estimate the number of times they need to empty a stamping container (cuboid) into a given glass tumbler so as to fill it.



- Once they estimate, they could be asked to their estimation.
- Ask them to verify it by filling water in the glass tumbler by using the given stamping container.
- The teacher can ask questions like: “Will the number vary if you change the stamping container?”
- Children can repeat the task with different containers and verify their estimation.



## Activity 6 Data Handling

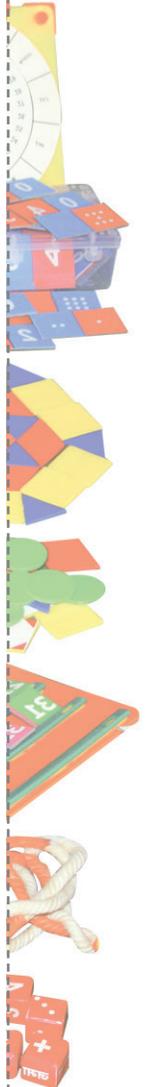
**This activity provides learning experiences for:**

Collecting data and its interpretation.

**Type of Activity:** Whole class is divided in groups of 5 children.

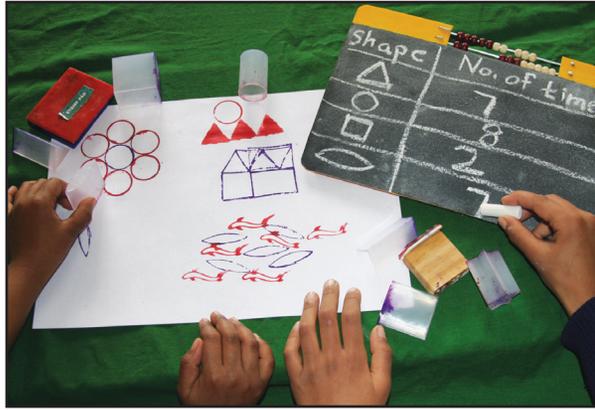
**How to Proceed:**

- Each group is given materials like different shapes, paper sheets, stamping-pad with ink.
- Each child in the group should perform one or the other tasks, e.g., one child counts, other writes, third child may make a picture, fourth child may write numbers in the table while the fifth tells/explains the work to the class.



▶ Stamping Containers

- Each group can make a picture by stamping various shapes.

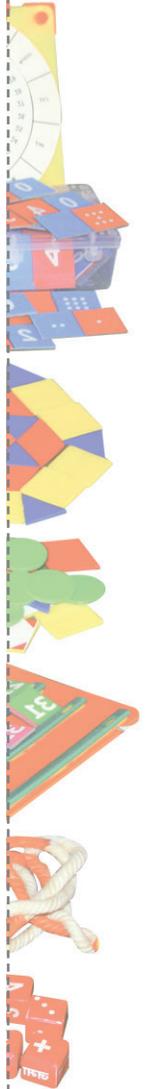


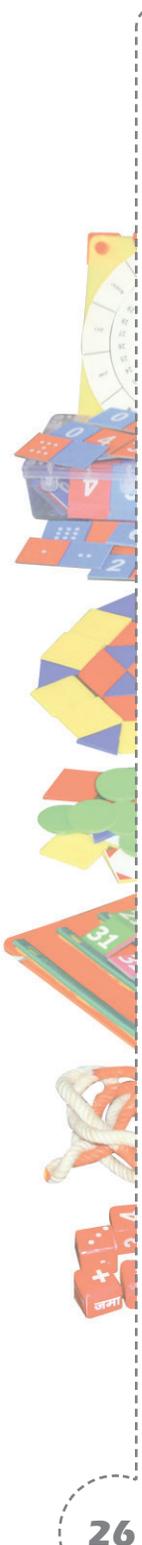
- Now they are encourage to record how many times a particular shape is used.
- The group can record the numbers of various shapes traced as shown below:

Shape	Number of times appeared
	
	
	
	
	

They can record it on a paper and the teacher can ask few questions like:

1. Out of  and  which is more and which is less?
2.  is used \_\_\_\_\_ times.
3. Number of  is more than \_\_\_\_\_.
4.  used \_\_\_\_\_ time.





## PLAY MONEY

### Concepts Dealt

- Recognition of the Indian currency in various denominations up to ₹ 100.
- Addition and Subtraction
- Place Value

### Activity 1 Handling Play Money

**This activity provides learning experiences for:**

- (i) Developing understanding of addition facts.
- (ii) Exploring different addition combinations of a number.

**Type of Activity:** Whole class is divided in pairs.

#### How to Proceed:

- Each pair is given some coins and notes of different denomination.
- Each child in the pair takes turn to pick up any note say of ₹ 10 from their money pool.
- The other child is encouraged to pick notes/coins of smaller denomination so that their sum is equivalent to the note the first child picked. For example ₹ 10 can be made by ₹ 5 + ₹ 2 + ₹ 2 + ₹ 1 or ₹ 5 + ₹ 5 or ...
- The first child checks if the other child has made a correct combination.
- Children can be encouraged to record it in their notebooks or on a slate.
- Now the other child challenges the first child by picking some money which will require more than one note say ₹ 13. Encourage children to keep a record by writing the denomination of notes picked to make ₹ 13 in their notebooks. For example, ₹ 13 = ₹ 10 + ₹ 1 + ₹ 1 + ₹ 1.
- Initiate the discussion about the number of ways one can get ₹ 13. There could be several combinations like ₹ 13 = ₹ (1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1) or ₹ 13 = ₹ (5 + 5 + 2 + 1) or ₹ 13 = ₹ (10 + 2 + 1) and so on.
- Teacher can further challenge the children by asking questions with conditions like, "Is it possible to make ₹ 13 by using ₹ 2 notes only?" "How can one make ₹ 13 by using at least one ₹ 5 note only?"

## Activity 2 Money Bank

**This activity provides learning experiences for:**

Strengthening the concept of addition.

**Type of Activity:** Whole class is divided in groups of 4 children.

**How to Proceed:**

- Each group is given a set of play money and two numeral dice.
- To begin the game, each group form a money bank from their play money.



- Each child in the group will take turns to roll the two numeral dice and will take out as much money as the sum of the numbers on both dice.
- Any other child from the group will write the combination of notes/coins taken for it like :

Number on 1st die	Number on 2nd die	Combination of notes
5	3	$5 + 1 + 1 + 1$
⋮		

- Now the turn to take out the money and roll the dice is passed on to the second child while some other group member writes.
- The game continues like this for some time in each group.
- Gradually children can be encouraged to explore the number of ways they can take out the money for a given combination of dice as shown in the above picture.

### Activity 3 How Many Tens and How Many Ones?

**This activity provides learning experiences for:**

- (i) Developing understanding of place value.
- (ii) Developing numberness.

**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- The game is about making different amounts using ₹ 10 note and ₹ 1 coin.
- Ask the children to show, say ₹ 27 using ₹ 10 and ₹ 1 coins only.
- Ask the children to write the combination of notes on their notebook as shown in the picture:

Total Money	₹ 10	₹ 1
27	2	7

- The activity is repeated for different amounts of money by using ₹ 10 and ₹ 1 coins only.

**Extension Activity**

While doing the activity, teacher can also ask children to show the combination for ₹ 72. Children can be encouraged to see and discuss how the number of ₹ 10 note and ₹ 1 coins vary when ₹ 72 is made as compared to ₹ 27.

### Activity 4 Learning Addition and Subtraction

**This activity provides learning experiences for:**

Developing an understanding of addition and subtraction facts.

**Type of Activity:** Whole class is divided in groups of 4 children.

**How to Proceed:**

- Each group shares a set of play money.
- Ask the children to pick a note from the set of play money and record it on their notebook/slate.
- Teacher will also pick some amount and ask the children to write it down in their notebooks.
- Now the teacher can ask the children to think and find how they can make the money equal to the amount in the teacher's hand?

- Teacher can ask whether one needs to add more money or one should take some money out ? How much?
- Children can use the money from the money bank to find the answer. Later children can continue the same activity in their groups.
- Children can one by one take the lead to compare their note money.

## Activity 5 Addition using Play Money

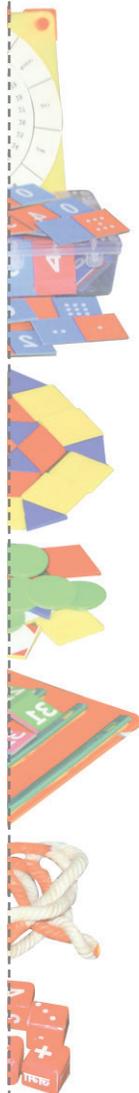
**This activity provides learning experiences for:**

- (i) Providing concrete experiences of addition using play money.
- (ii) Strengthening the understanding of place value.
- (iii) Providing an opportunity to understand the concept of carry(regrouping) and reduce the general errors committed in addition by the children.
- (iv) Providing an opportunity to move from concrete experiences to abstract ideas.

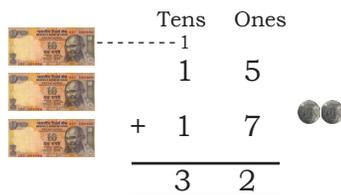
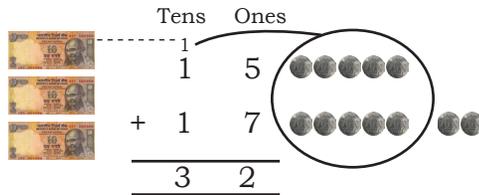
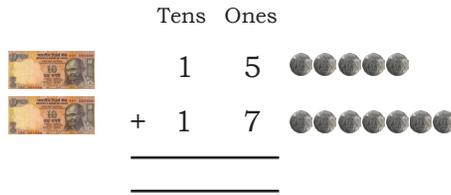
**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Each pair is given play money using only twenty coins of ₹ 1 and five notes of ₹ 10.
- Teacher will put a situation problem and will ask to solve it by using play money. For example - A pen cost ₹ 15 and a packet of colour cost ₹ 17. How much money does Rani requires to buy both the things?
- Ask children to show amount of ₹ 15 and then show ₹ 17 using play money.
- Children will combine both the amounts and find the total money needed as ₹ 32.
- Teacher can state a rule of the activity as we cannot keep ten coins of ₹ 1 together, whenever we will have loose 10 coins of ₹ 1, we will exchange them with one note of ₹ 10.
- Teachers asks the children to exchange the loose coins and then count again to find the total money needed.
- Teacher simultaneously, will record the process on the board and ask the children to write down in their notebook as well.



▶ Play money



- After exchange, encourage children to explain how they found the total money? How many coins do they have? Let children respond freely as “two coins of ₹ 1 and three notes of ₹ 10”.

**Note**

Pose more examples of situation problems and ask children to solve using play money and simultaneously devise their ways to record in the notebook.

## Activity 6 Subtraction using Play Money

**This activity provides learning experiences for:**

- (i) Providing concrete experience of subtraction using play money.
- (ii) Strengthening the understanding of place value and subtraction.
- (iii) Providing an opportunity to reduce the general errors committed in subtraction by the children.
- (iv) Providing an opportunity to move from concrete to abstract thinking.

**Type of activity:** Whole class is divided in pairs.

**How to Proceed:**

- Each pair is asked to take out twenty coins of ₹ 1 and five notes of ₹ 10.
- Teacher then puts a situation problem of subtraction and ask students to solve using play money. For example: Raju had ₹ 25. He bought a packet of colours which cost ₹ 17. How much money does he left with?
- Ask each pair to show amount of ₹ 25 and then ask to reduce ₹ 17. The teacher can pose questions like: “Can we give ₹ 7 from the five coins of ₹ 1”; “How can we give ₹ 7?”
- Give children some time to think and some children in class would suggest to exchange ₹ 10 with 10 coins of ₹ 1.
- Encourage other groups also to exchange ₹ 10 note with ten coins of ₹ 1. Simultaneously show the process on the board.

Tens	Ones	
2	5	
-	1 7	

Tens	Ones	
<del>2</del>	<del>5</del> 15	
-	1 7	
0	8	

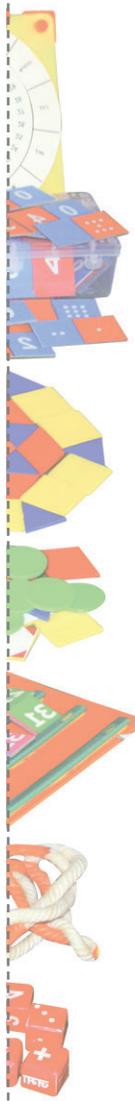
- Teacher can explain how after exchange there are now fifteen coins of ₹ 1 from which ₹ 7 can be easily take away.
- Each group is encouraged to record the process in their notebooks.

**Note**  
 Teacher can give some more situation problems requiring subtraction. Children can also be encouraged to pose such problems to each other.

**Activity 7 Fun with Play Money**

**This activity provides learning experiences for:**

- (i) Collection and organisation of information.
- (ii) Developing understanding of classification and combination



▶ Play money

**Type of Activity:** Whole class is divided in groups of 4-5 children.

**How to Proceed:**

- Teacher will provide a bunch of notes and coins to each group.
- Teacher ask the children to take out some amount say ₹ 24 using coins and notes.
- Teacher in the meanwhile can go to each group to observe and discuss different number of notes and coins used by each group.
- Teacher then asks the groups to classify different notes and coins on the basis of the value they hold.
- Now the teacher may ask the groups to fill the following table:

Types of coins/ notes	Number of coins/notes
₹ 1 	
₹ 2 	
₹ 5 	
₹ 10 	

- Teacher interacts with the children and ask the following questions:
  - Which coins and notes did they use to make ₹ 24?
  - Which coin or note is missing from their bunch?
  - Which note has been used the most?
  - Which note has been used the least?
- Groups can be encouraged to see what combination of notes and coins have been used by other groups.

**Extension Activity**

Teacher may further challenge the children by taking some notes out and asking to exchange them for some other combinations of notes/coins without changing the amount. The same activity can be repeated for some other amount aslo.

## Activity 8 Games with Play Money

**This activity provides learning experiences for:**

Developing an understanding of addition, subtraction and place value, through money transactions.

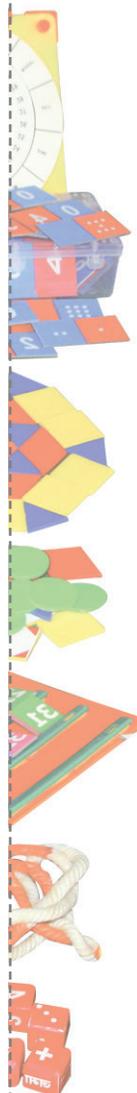
**Type of Activity:** Whole class.

**How to Proceed:**

- Children can be asked to collect different objects or wrappers of different objects like water bottle, toy, pencil, eraser, notebook, etc. Children can also make these objects from clay. These objects will then be given a price tag with the help of the teacher.
- Few children can become shopkeepers and let them arrange the tagged objects for sale.
- Remaining children can act as buyers.
- Each child keeps records of what all she/he bought, the amount she/he gave and received back.



- Child’s work can be displayed in the classroom.
- This activity can be further extended by posing certain conditions like (a) Buy atleast 5 items. (b) Total bill amount should not exceed ₹ 50 and so on.



## DOMINO NUMBER CARDS

### Concepts Dealt

- Number Sense
- Number Operations (Addition and Subtraction)
- Addition facts

### Activity 1 Make a Chain

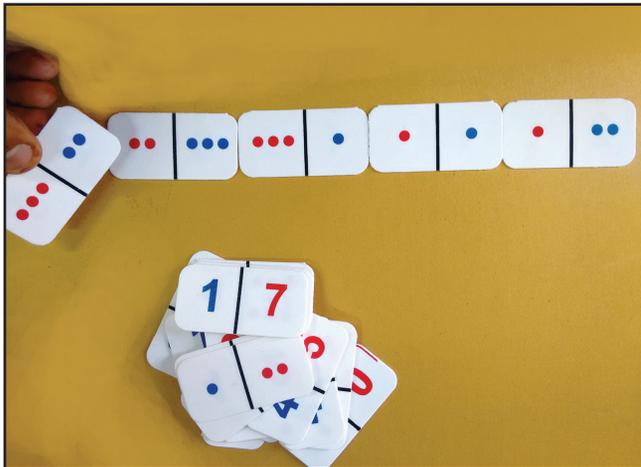
**This activity provides learning experiences for:**

- (i) Developing understanding of one to one correspondence and numberness.
- (ii) Developing numeral recognition for numbers 0 to 9.

**Type of Activity:** Whole class is divided in pairs.

### How to Proceed:

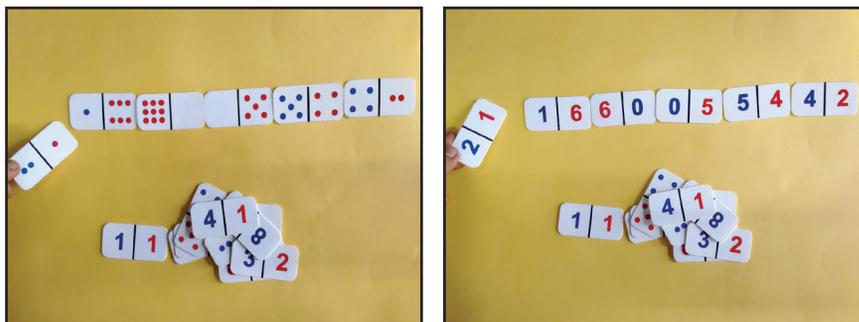
- Each pair is given around 25 domino number cards.
- The first child will place any one of the domino number cards with dots side up.
- The other child now put such a domino number card, which has same number of dots on its one part as the dots on the last part of the domino number card kept by the first child as shown in the picture.



- Now the first child take the turn to put a domino number card with equal number of dots on its first part as the dots on last part of the domino number card kept by other child.
- Finally a chain will emerge.

### Extension Activity

- After children have done this activity for some time they can be introduced to another rule of putting the numeral side upwards for every consecutive domino number card.



- Later children can be encouraged to put all the domino number cards with numeral side up.

## Activity 2 Make Groups

**This activity provides learning experiences for:**

- Recognising numerals 0 to 9.
- Encouraging children to sort, classify and make groups according to the dots/ numerals printed on the domino number cards.
- Encouraging children to describe the logic they have used to sort and make different groups.
- Associating the number of dots with its respective numeral notation.
- Using the dot patterns and developing own strategies to add the given dots/numerals given on a domino number card.

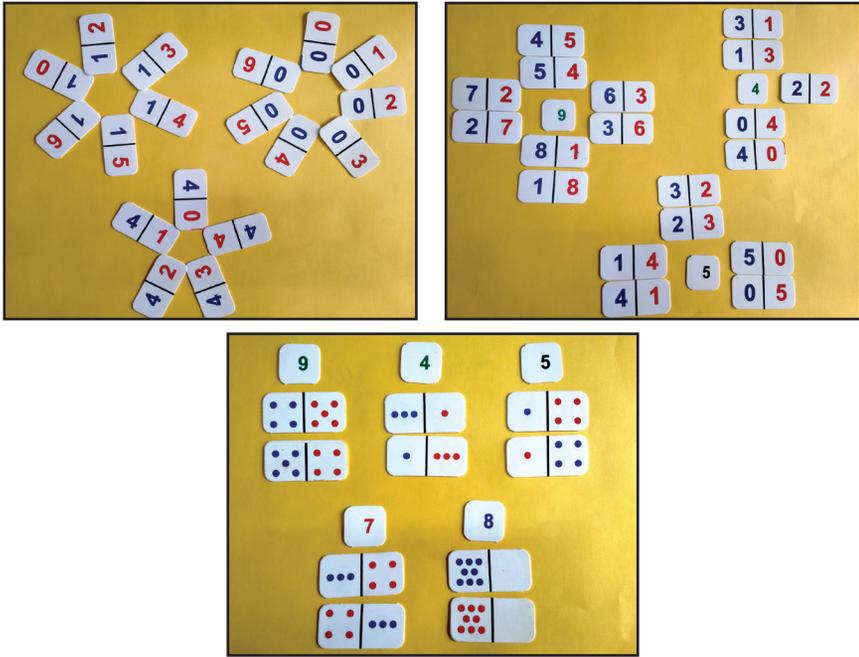
**Type of Activity:** Whole class is divided in groups of 4 children.

**How to Proceed:**

- Each group is given a set of domino number card.
- Children are encouraged to sort and make groups on the basis of the numbers or dots printed on the domino number card.
- Children can use dot or numeral side to make the groups depending on their comfort.

▶ Domino Number Cards

- Some ways in which children may sort and make group are shown below:



The teacher then goes individually in each group to encourage children to explain how they have sorted their domino number cards. Teacher can encourage children to describe how they have made the groups and why they have placed the given domino number card in that particular group.

### Extension Activity

Once children get the idea of what is expected in the activity, they can be encouraged to work in groups. Children are encouraged to choose any one way of grouping and come in front of the class to describe on what basis have they sorted their cards. This would help children to think logically and articulate their thinking using mathematical language like more, less, bigger or smaller number.

### Activity 3 Who is Equal to Me?

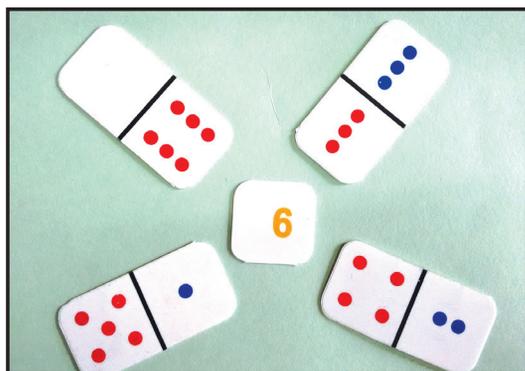
**This activity provides learning experiences for:**

Encouraging children to count numbers using strategies like, recognising visual representation of dots and adding them.

**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Teacher will call out any number, say 6.
- Children are encouraged to look for the domino number card having a total of six dots on it, i.e., 5, 1; 4, 2; etc.



- The activity is repeated with different numbers.

**Activity 4 Who has More Pairs?**

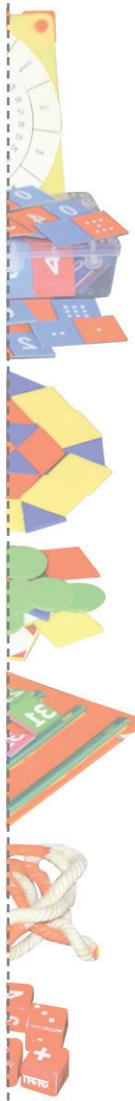
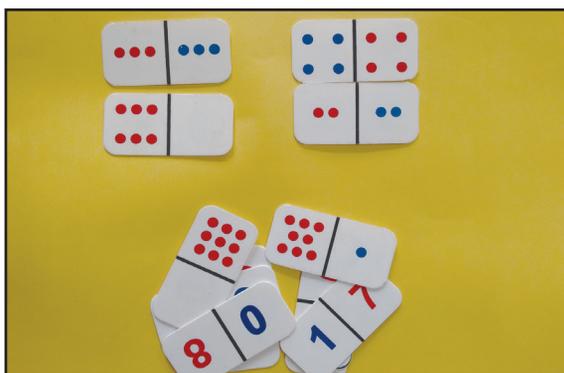
**This activity provides learning experiences for:**

- Enabling children to compare numbers.
- Enabling children to explore various addition facts.

**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Give a set of domino number cards to each group.
- Ask them to see how many pairs of domino number cards are there which have equal number of total dots.
- Suppose the first pair of children pick some domino number cards and take out the domino number card which have pairs as follows:



▶ Domino Number Cards

- The one who gets the maximum number of pairs will be the winner.
- Here the pair of children on the left is seen to get maximum number of domino number cards having equal number of dots.

## Activity 5 Number Train

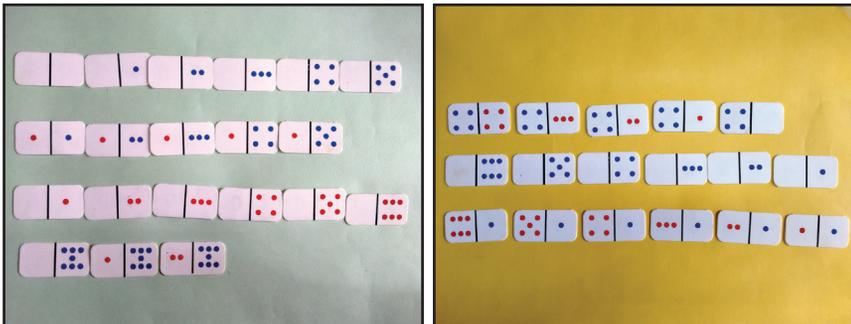
**This activity provides learning experiences for:**

- Recognising numerals 0 to 9.
- Encouraging children to make patterns according to the dots/ numerals printed on the domino number card.
- Encouraging children to describe the logic they have used to make the pattern.
- Associating the number of dots with its respective numeral notation.
- Using the dot patterns and developing strategies to add the given dots/numerals given on a domino number card.

**Type of Activity:** Whole class is divided in groups of 4 children.

**How to Proceed:**

- The four children in a group are given a set of domino number card.
- Children are encouraged to make some design or pattern on the basis of the number or dots printed on the domino number card.
- Children can use dot or numeral side to make their design or pattern depending on their comfort.
- Some designs or patterns, children can make are shown below.



- The teacher then goes individually in each group to encourage children to explain their design or pattern to each other.
- Teacher can help children articulate their thinking by asking questions like what they have made? How did they decide which domino number card should come next? Why have they placed the given domino number card at that particular place?

### Extension Activity

- Once children get the idea of what is expected in the activity, they can be encouraged to work in a group. Children are encouraged to make any one design or pattern as a group and come in front to describe to the whole class what design or pattern they have made and how.
- Later other children in the class can be encouraged to even predict which card(s) would be needed to extend the pattern.
- This activity would help children to think logically, articulate their thinking using mathematical language like more, less, bigger or smaller and see numbers in a relationship with each other.

## Activity 6 **Guess Me If You Can?**

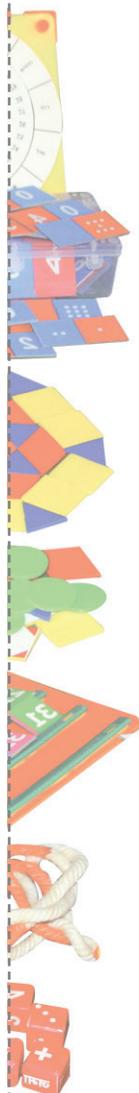
**This activity provides learning experiences for:**

- (i) Developing ones own calculation strategies to win the cards.
- (ii) Apply the knowledge of addition facts for numbers 1 to 9.

**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Each pair is given 10 domino number cards.
- The game is about guessing the number of dots on the other part of card to win the card.
- The first child takes out a domino number card from her/his pile. She/he shows either red or blue coloured dot side to the other child. As a clue, she/he tells the total number of dots on the domino number card to the other child. On the basis of the given clue to win the card, the other child need to guess the number of dots on the other



### ▶ Domino Number Cards

side of the domino number card on the basis of clue given by the first child.



- While playing, the children may use different strategies like counting on fingers, using their previous knowledge of addition facts or mentally add on to guess the number.
- If the child is able to guess correctly, she/he can win the card and add it her/his pool of cards. If otherwise the first child who showed the card can retain it in her pool of cards.
- Now the other child takes one card from her pile, and shows any one coloured dot side. She tells the total number of dots on the domino number card as a clue, and let the first child to guess the number of dots on the other half of the domino number card.
- The game continues till the children have finished asking about all the 10 cards each child had. The child with maximum number of cards in their pool will win the game.

### **Extension Activity**

After children have played this game for some time with dot sides up, children can now be encouraged to use the numeral sides up.

### **Activity 7 Pick Me If You Can?**

**This activity provides learning experiences for:**

- (i) Recognising numerals 0 to 9.
- (ii) Associating the number of dots with its respective numeral notation.
- (iii) Using own strategies to add two numerals given on the domino number card or apply their knowledge of various addition facts for numbers 1 to 9.
- (iv) Developing strategies to win the game.

**Type of Activity:** Whole class is divided in groups of 4 children.

**How to Proceed:**

- Each group is given 32 domino number cards to distribute among each member equally, i.e., 8 domino number card each.
- The game is about winning the maximum number of cards.
- The first child puts a domino number card in centre say

2	2
---	---

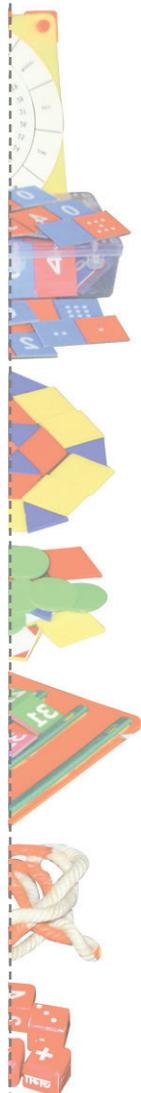
- To win this card the second child needs to put a domino number card with the same sum that is

0	4
---	---

Or

1	3
---	---

- If the second child puts any of the domino number card as shown above she/he can win the card kept by the first child. For the game to continue, the second child puts another card in the centre.
- If the second child does not have any domino number card with given combination of 4 or she/he is unable to put it out then she/he keeps any other domino number card to continue the game.
- Now, the third child needs to look for a domino number card with same sum as kept by the second child to win the card(s) kept in the centre.
- Children are given the freedom to use the dot side to add and verify their calculations.
- The game is continued for sometime in the given manner. In the end, children count their cards and the one with maximum number of cards becomes the winner.
- After children have played this game for sometime, a whole class discussion can take place about who won the game? How? What strategies did she/he use? Children may share that they avoided to put the cards with larger sum in the centre as there is more possibility of others to



▶ Domino Number Cards

have a card with same sum. They may also share that sometimes they tried to hold/extend the game by putting domino number cards with smaller sum in centre as others may not have it.

### Extension Activity

The game can be modified by introducing the rule of 'one more'. According to this rule, the next child now has to keep a card whose sum is one more than the sum of the card kept by the previous child. This would provide an additional challenge of comparing two numbers and putting the card accordingly. Similarly, the rule of one less can be adapted. After sometime, they may come up with new strategies. In case the game is played with rule of 'one more' if the child put a card with sum 9 then it is not possible for the next child to win the card(s). The same is true for the card with one dot in case of game with rule 'one less'.

## Activity 8 Different Number Combinations

**This activity provides learning experiences for:**

- (i) Exploring all the possible addition facts for numbers upto 9.
- (ii) Strengthening of written notation used to represent addition facts.

**Type of Activity:** To be done individually by each child.

**How to Proceed:**

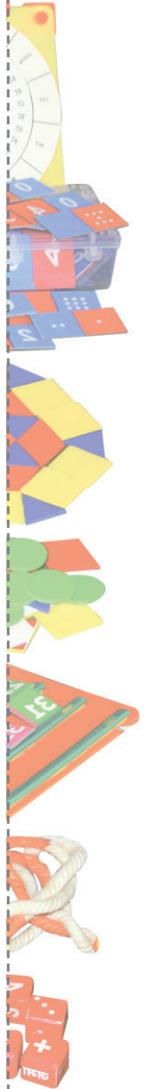
- Child is encouraged to look for all those domino number cards that have a total of 9 dots or 9 as the sum of the two numbers.

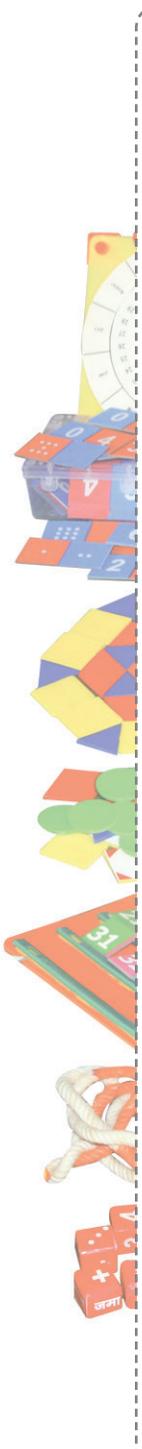


- Child is further encouraged to write all these combinations like:

$$\begin{array}{r} 1 + 8 \\ 3 + 6 \\ 2 + 7 \\ 7 + 2 \\ : \\ : \\ \text{etc.} \end{array}$$

- The teacher can then ask children to find out all the addition combinations for other numbers as well with the help of domino number cards.





## NUMBER CARDS

### Concepts Dealt

- Numeral Recognition
- Number Operations (Addition and Subtraction)
- Number Patterns

### Activity 1 Show the Number Card

**This activity provides learning experiences for:**

- (i) Identifying numerals.
- (ii) Developing numberness

**Type of Activity:** Whole class is divided in pairs.

#### How to Proceed:

- Teacher will call out a number aloud.
- Children will pick appropriate number card from their set and place it on the bench/table/floor.
- After calling some numbers, the teacher goes around to check whether all the children are placing the right numeral or not.
- The teacher can also ask children to put the cards in increasing or decreasing order.

### Activity 2 Listen and Write

**This activity provides learning experiences for:**

Strengthening the identification of numerals.

**Type of Activity:** Whole class is divided in pairs.

#### How to Proceed:

- Provide each pair with number cards.
- Ask one child to pick a number card from the set and place it on bench/table/floor without showing it to her/his partner.
- She then tells that number to her/his partner.
- The other child will write the said numeral on her/his notebook. Both the children needs to hide their written numbers from each other.



- After writing the numeral, both the children will check if the numeral written on their notebook and number card are the same.

### Activity 3 Same to Same

**This activity provides learning experiences for:**  
Enabling the children to recognise numerals.

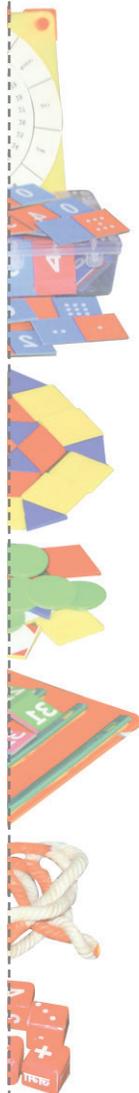
**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Provide each pair with two sets of number cards, numerals upto 20.
- All the 40 number cards can be placed on bench/table/floor in a jumbled form, with the coloured side up.



- First child will choose any one card and upturn it with the numeral side up.
- The other child will then choose another card and upturn it. If the number on the card matches to the card



### ▶ Number Cards

already opened, then the child can win both these cards. Otherwise, the card will be kept with numeral side up.

- In this way the game will continue and at the end, the child with more pairs of matching cards will become the winner.

## Activity 4 Making Number Train

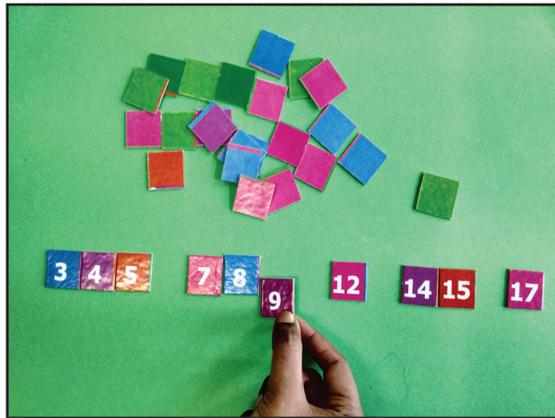
**This activity provides learning experiences for:**

- (i) Developing numeral recognition upto 20.
- (ii) Number Concept.

**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Provide each pair with one set of number cards upto 20.
- The pair keeps the number cards with numeral side down. Now, each child takes turns to open one number card at a time and place it to make a number train by keeping it on its appropriate position.
- Finally, a number train/sequence where number cards from 1 to 20 are arranged in sequence will emerge as shown in the picture.



## Activity 5 Make Colour Patterns

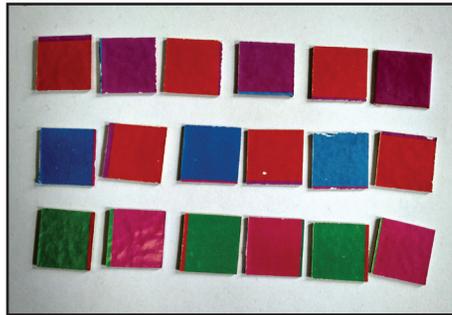
**This activity provides learning experiences for:**

Recognising, extending and creating different colour patterns and number patterns.

**Type of Activity:** The whole class is divided in pairs.

**How to Proceed:**

- Teacher can begin the activity by making a simple colour pattern (by using 2 different coloured number cards only) and show it to the whole class.
- Ask students to extend the pattern further on. When comfortable with recognising and extending patterns, ask children to do this activity in pairs.
- Let one child make a pattern and the other recognise and extend it.



- Gradually ask children to make more complex and interesting colour patterns using more than two colours.

**Activity 6 Make Number Patterns**

**This activity provides learning experiences for:**

Exploring number patterns.

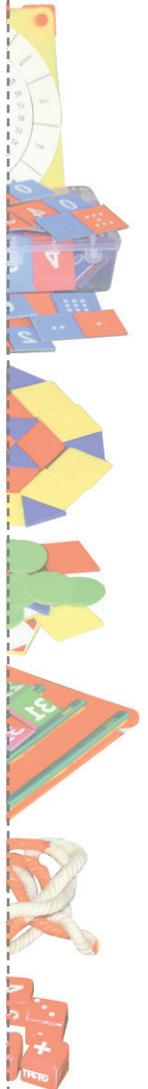
**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Place the number cards from 1 to 20 in a sequence on the table/floor.
- Pick every alternate number card, starting from 1.



- Facilitate children to observe the number pattern in the number cards left on the table/floor.





▶ Number Cards

- Children can be encouraged to guess and extend the pattern.
- At the end ask them to write the number pattern in their notebook.
- Various number patterns like 5, 10, 15, 20, ... can also be created and children can be encouraged to extend it.
- In the same way, children can challenge each other where one child makes the number pattern and the other child extends it.

### **Activity 7** Identify the Patterns

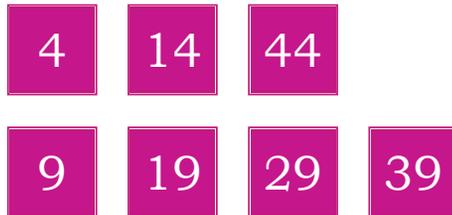
**This activity provides learning experiences for:**

Developing logical reasoning and thinking.

**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Ask the children to sort the number cards on the basis of colour (all Pink).
- Now ask them to reverse the cards and put them in increasing order and observe the numbers written on them. For example



- Now the teacher can ask them if they can observe pattern.
- Similarly ask them to sort out other colours and observe number patterns on them.

### **Activity 8** Identify the Number Patterns

**This activity provides learning experiences for:**

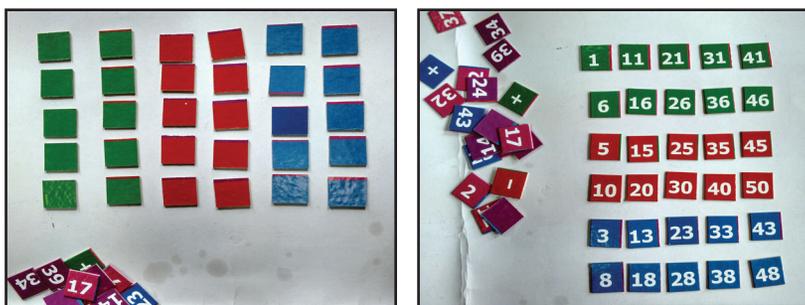
Developing logical thinking and reasoning.

**Type of Activity:** Whole class is divided in groups of 4 children.

**How to Proceed:**

- Each group works with one set of number cards.

- The teacher calls out the name of any colour from the number cards.
- Children take out all the number cards with the given colour.
- The teacher then ask the children to put the number cards in increasing order and form a number train.
- Children are asked to observe the number train and describe how the number cards are placed in the given number train.
- To increase the challenge the teacher can call out name of any two colours and children form the number train as shown in the picture below.



- Children are encouraged to describe the pattern in the number train and to use words like more, less.
- Later children can do this activity in pairs, where they challenge each other to form any number train and describe it.

## Activity 9 Exploring Numbers

**This activity provides learning experiences for:**

- Developing number concept till 50.
- Strengthening the concept of addition and subtraction.
- Developing strategies for addition like using addition facts, 10 based structure of the grid.

**Type of Activity:** Whole class is divided in groups of 4 children.

**How to Proceed:**

- We all would have enjoyed the game of snake and ladders as children. This game tries to take the enjoyment element of that game but with a mathematical twist to aid learning of numbers and do various addition and subtraction problems in an enjoyable manner.

## ▶ Number Cards

- Each group works with one set of number cards and set of 3 dice that are – one dot die of 1 to 6, one numeral die of 0 to 5 and one number operation die with addition and subtraction written on it.
- Children are encouraged to sort and put the number cards in an increasing order from 1 to 10 in one line. Then number cards from 11 to 20 are placed above the number cards 1 to 10 such that 11 comes above 1, 12 above 2 and so on. Finally a grid of numbers 1 to 50 as shown in the picture emerges.

41	42	43	44	45	46	47	48	49	50
31	32	33	34	35	36	37	38	39	40
21	22	23	24	25	26	27	28	29	30
11	12	13	14	15	16	17	18	19	20
1	2	3	4	5	6	7	8	9	10

- The colour coding on number cards becomes apparent in the grid when placed in the given manner. For example, numbers like 2, 12, 22 ... are of pink colour while numbers like 9, 19, 29... are of purple colour. Unlike the snake and ladder, here the colour coding and given arrangement of the number cards helps in understanding the ten based structure of our numeration system that is 12 means 10 and 2, 19 means 10 and 9 and so on.
- Children can use things like four different cereals, spare buttons or different coloured small crushed paper balls as pegs. Each child takes one peg as her counter. The game is about reaching home, i.e., reaching 50 as quickly as possible to win the game.
- The game is played in turns using three dice. To start, children are asked to keep their pegs outside the grid near number card one.
- The first child throws three dice. The child now operate two numbers as per the operations obtained of the dice. For example, a child gets 6 dots, symbol for subtraction and numeral 4 when she throws the three dice. The child has to mentally subtract 4 from 6. As the game has just started she will put her peg on number card 2. Other children also take turns to begin playing.

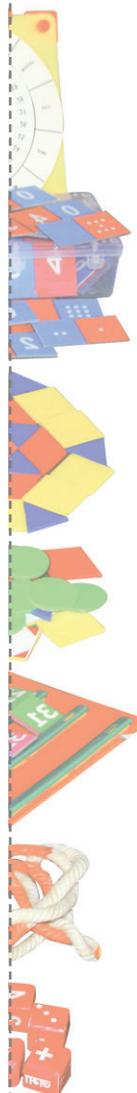
- Sometimes children always count from zero (0). So it is important to tell children to start counting on from where the peg was kept last at. For example, in case of the girl whose peg was at number card 2, gets 3 dots, + symbol and 4 dots. She would start counting from 2 and take 7 more steps and reach 9.
- The game continues till children reach home (i.e., number card 50). The child who reaches 50 first becomes the first winner while the second child to reach 50 becomes the second winner and so on.
- Children can be encouraged to help and check each others moves. Aspects like peer learning, giving purpose to do various addition and subtraction problems (i.e., to reach home as quickly as possible) and flexibility to use strategies like operating using addition facts on fingers, etc., depending on the comfort of the child make this game quite useful in a mathematics classroom. The teacher can use various modifications as discussed below to increase or decrease the mathematical challenge involved.

### **Extension Activity**

- To increase the mathematical challenge, the dot dice can be replaced by the numeral die of 5 to 10. The teacher can also introduce an additional rule of first doing the steps mentally using the grid and then move ahead instead of counting in ones. This will prompt children to use the number grid more effectively. For example, if the child is on number 7 and she/he needs to move 9 step ahead. The child may use the 10 based arrangement of the number cards, i.e., the child may jump to 17 and then take one step backward to reach 16.

### **Note**

Initially children can also use the number cards till 20 and play with one die.



## BLOCKS

### Concepts Dealt

- Sorting
- Counting
- Number Sense
- Grouping
- Addition, Subtraction

### Activity 1 Playing with Blocks

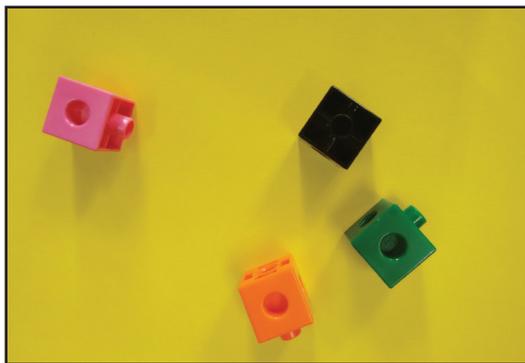
#### This activity provides learning experiences for:

Development of spatial vocabulary like top-bottom, near-far, etc.

**Type of Activity:** Whole class is divided in groups of 4 children.

#### How to Proceed:

- Children are asked to make any arrangement using blocks.
- Children are made to sit in a circle and take turns to show the arrangement pointing its top and bottom.
- Ask any group to place their arrangement in front of the class. Discuss about whose arrangements is far from board/door? Whose is near?
- Now ask the other group to place their arrangement in front of the class and repeat the same discussion regarding near-far. (Initially objects should be placed as such that the difference in distance between arrangements and board/door is easily visible and comparable.)
- Further, near and far with reference to their friends can also be discussed.



- Use classroom as a resource to develop spatial vocabulary, viz., inside-outside, on-under, etc., as it helps children to grasp the space around them.

**Extension Activity**

- Same activity can be extended to develop concept of measurement.
- When blocks or tiles are placed randomly and it becomes difficult to estimate just by seeing. Children can use the blocks as a unit to explore near and far.
- Teacher should encourage children to put blocks one against the other so that no gap is left while measuring the distances.

**Activity 2 Classify, Count and Write**

**This activity provides learning experiences for:**

- Enabling sorting and counting of blocks.
- Organisation of information in a tabular manner.

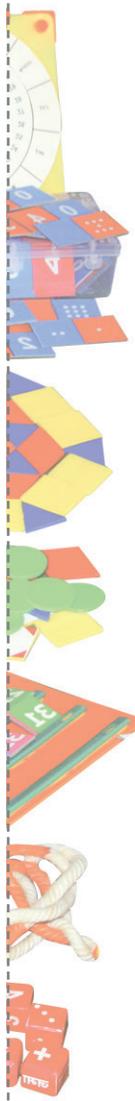
**Type of Activity:** Whole class is divided in groups of 4 children.



**How to Proceed:**

- Provide each group with some blocks.
- Encourage children to sort these blocks on the basis of colours.
- Ask children to count the number of blocks in each group and find for which colour blocks are the maximum.
- Help children to record the number of blocks they have counted in tabular form as shown below:

Colour	Red	Green	Yellow	Black
Number of Blocks				



### Activity 3 Make Objects

**This activity provides learning experiences for:**

- (i) Developing spatial understanding.
- (ii) Introducing tabulation of Data.

**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Each pair can play with blocks and make different arrangements by joining them, e.g., train, bridge, chair, table, road, swings, alphabets, numerals, joker, building, etc.
- In making of different arrangements, and free play with each other using the block, children learn to talk using various spatial vocabulary like inside-outside, small-big, up-down.

**Extension Activity**

- This Activity can further be extended to data handling.
- Teacher goes to each pair and ask the following questions:
  - How many same coloured blocks have been used in creating the object?

Colour of Blocks	Number of Blocks
Orange	
Black	
Green	
Yellow	
Pink	

- Which coloured blocks have been used the most?
- Which coloured blocks have been used the least?
- Children should be provided with enough time to play, make or explore and then discuss with them.

### Activity 4 Pick the Correct Number Card

**This activity provides learning experiences for:**

Developing concept numberness.

**Type of activity:** To be done individually by each child.

**How to Proceed:**

- Teacher says a number loudly and each child will pick up the required number of blocks.
- Encourage children to find the appropriate number card and place it near the blocks from the kit. For example, numeral 1 near one block, 5 near five blocks and so on.

**Activity 5    Make Numbers**

**This activity provides learning experiences for:**

Understanding the concept of grouping in tens (place value).

**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Provide each pair with around 20 blocks in two colours.
- Ask each pair to represent a number say 17, using blocks.



- Ask each pair to join 10 blocks and make a tower, and let other remaining blocks loose. For example, for 17 one tower of 10 blocks and 7 loose blocks.
- Children can record the representation of blocks in notebooks/slates as given below.

Number	Tower	Loose
17	1	7
27	2	7

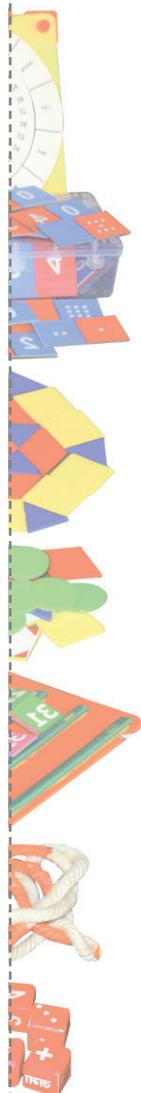
**Note**

The activity can be repeated for various other numbers to familiarise children with the idea of grouping in tens.

**Activity 6    Expand the Number**

**This activity provides learning experiences for:**

Strengthening the understanding of place value.



**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- Show two towers of 10 blocks each and seven 7 blocks to the children.
- Ask them to see and count the number of blocks and write down in their notebook/slate. For example, children will write it as:

Tens	Ones	Number
2	7	27

- Activity is repeated for other numbers also.

### Activity 7 Pick the Blocks

**This activity provides learning experiences for:**

Developing the concept of addition and subtraction.

**Type of Activity:** To be done individually by each child.

**How to proceed:**

- Teacher can ask the child to pick blocks equivalent to any number, say 6.
- Now ask to show another number, say 4 from these blocks.
- For this, child can modify her/his original set of blocks instead of picking new blocks again whenever a new number is asked. For example, in the first round 6 blocks are picked. In the second round, if 4 blocks are to be picked then the child should put back 2 blocks so that 4 remains with her. But if 8 blocks are to be picked in the second round then the child has to pick 2 more blocks as she already has 6 blocks.

### Activity 8 Add the Blocks

**This activity provides learning experiences for:**

Developing the concept of addition and subtraction.

**Type of Activity:** Whole class is divided in pairs.

**How to Proceed:**

- In class I, the activity can be played by taking two numeral dice having numerals from 0 to 5.
- Children can play this in pairs where one child will roll both the dice together.



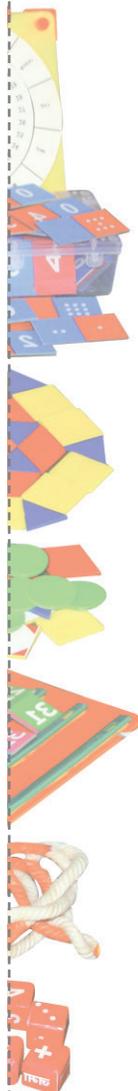
- She will pick the blocks equal to the number on the first die.
- She will then add the blocks equal to the number on the second die to get the total number of blocks.
- The second child keeps the record in their notebook as:

1st dice	+	2nd dice	=	Total
5	+	3	=	8
0	+	2	=	2

- The children can exchange the roles in the next turn.

**Extension Activity**

The activity can also be performed to strengthen the concept of subtraction by taking 0 to 5 and 5 to 10 dice.



## DICE

### Concepts Dealt

- Number sense
- Comparison of Numbers
- Addition and Subtraction

### Activity 1 Die says How Many?

#### This activity provides learning experiences for:

Developing number sense.

**Type of Activity:** To be done individually by each child.

#### How to Proceed:

- Ask any one child to come in front and roll the die. The rest of the children sing the rhyme – “Say! Say! Say! The die says how many?”.
- The child will roll the die and will read the number aloud, suppose the number is 4, then the child will say: “Die says number 4.”



- Then all the children will pick the given number of objects as said by the child.
- The objects could be blocks, circular discs, tiles, money, etc.

### Activity 2 Add the Numbers

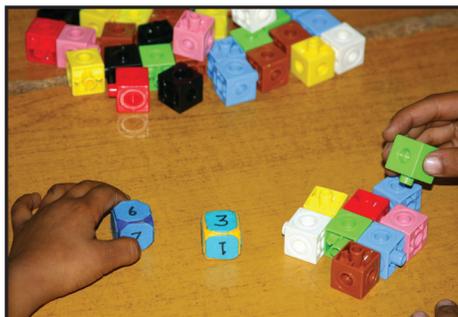
#### This activity provides learning experiences for:

Understanding of addition facts and comparison of numbers (greater and less than).

**Type of Activity:** Whole class is divided in groups of 4 children.

**How to Proceed:**

- Ask children to take turns to roll the two dice (0 – 5 and 5 - 10).

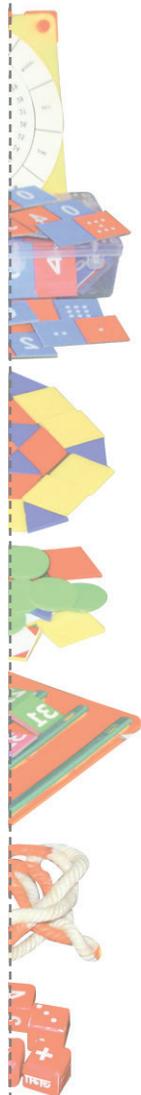


- Children can use concrete material or develop their own strategies to find the sum.
- Children record the sum of numbers in their notebooks. For example

Number on the first die	Number on the second die	Total
0		
1		
2		
1	5	6
2	6	8
0	9	9
0	7	7
3	6	9

Teacher can ask the following questions:

- What is the maximum sum and minimum sum they get?
- What is the maximum sum possible using these dice?
- How do you reached to this conclusion?
- On what ways can we get a total of 12?
- Write all combinations possible for getting a total of 15, other than the ones they found out while playing with dice.



## PLACE VALUE CARDS

### Concepts Dealt

- Place value
- Patterns

### Activity 1 World of Place Value Cards

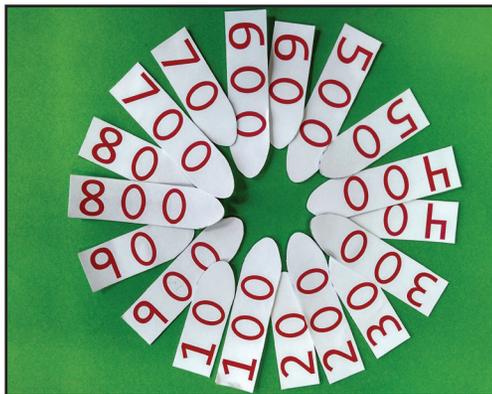
**This activity provides learning experiences for:**

- (i) Classify using value of number.
- (ii) Creating patterns.

**Type of Activity:** Whole class is divided in groups of 4-5 children.

### How to Proceed:

- Prior to doing these activities the teacher needs to clearly specify how the cards should be held and placed on each other. Demonstrate, how the curved end of each cards should overlap to hold the different cards together.
- Each group works with a set of Place Value Cards.
- Teacher ask children to carefully observe and arrange the cards in some order/pattern with the numeral side up.
- Teacher may involve the children to make various arrangements/patterns, shown in the picture



- Discussion can be done on the logic or strategies children used to make these arrangements/patterns.

## Activity 2 **Make Patterns using Place Value Cards**

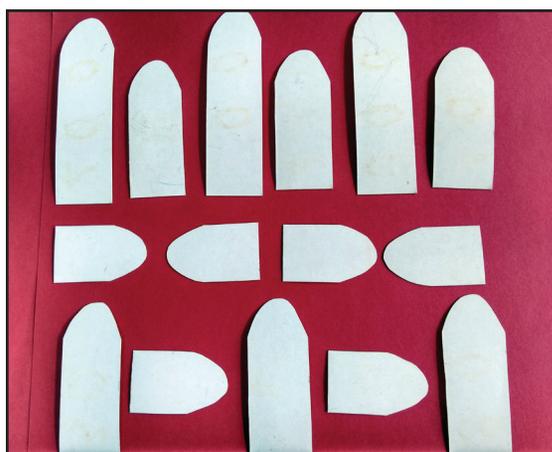
**This activity provides learning experiences for:**

- (i) Creating patterns.
- (ii) Developing logical thinking and reasoning.

**Type of Activity:** Whole class is divided in groups of 4-5 children.

**How to Proceed:**

- Each group is given a set of Place Value Cards. Encourage children to make designs or patterns using the blank side of Place Value Cards.
- Children can make designs or patterns by changing the number of cards or by arranging the cards in different positions as shown in the picture.

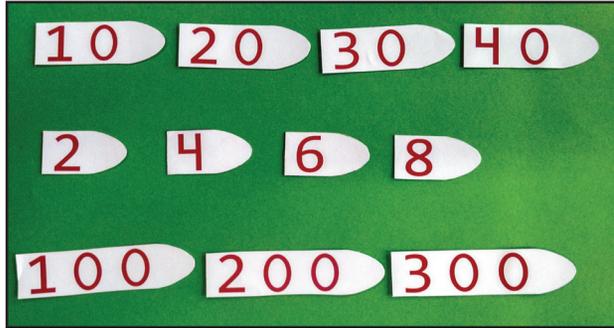


- The teacher can also make patterns using these cards and encourage children to observe and share the logic or strategy used.
- Meanwhile the teacher can go to different groups and ask them to describe their designs or patterns.
- Children can be encouraged to move around to see what patterns and designs have been made by other groups.
- Children can be asked again to work in their group and make a design and pattern which they can trace on a chart paper/notebook and present it to the whole class.

► Place Value Cards

**Extension Activity**

The same activity can be done using the number side up. For example, children can come up with design like



- Encourage children to make patterns like:

11	22	33	44	55
19	28	37	46	55

Children can also be encouraged to predict which number would come next.

**Activity 3** **Make the Number**

**This activity provides learning experiences for:**

- Write numbers in their expanded form.
- Develop the understanding of numbers in tens and ones.

**Type of Activity:** Whole class

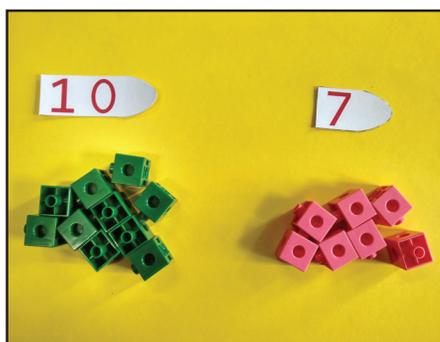
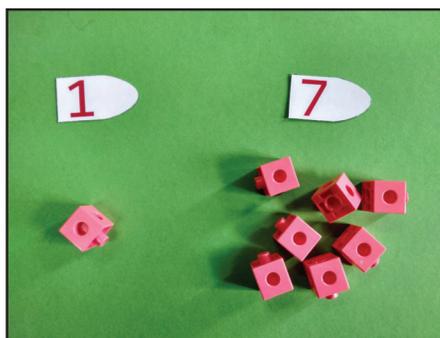
**How to Proceed:**

- Ask any child to come forward and say any single digit number loudly say 5



- Other children pick and show the corresponding Place Value Card.

- Now ask them to show two-digit numbers by using Place Value Cards, say 17.
- While doing the activity suppose if a child shows 17 by using two single digit Place Value Cards of 1 and 7.



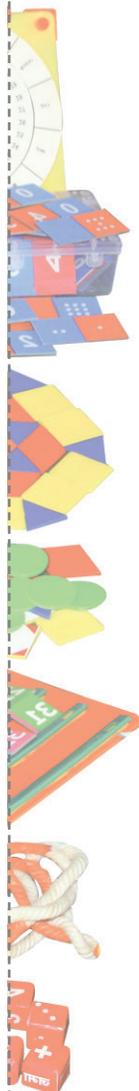
- Then the teacher can ask the child to pick blocks according to the cards, i.e., 1 and 7 blocks and then pick 17 blocks and group them in tens and ones. This will help the child in correcting herself/himself that 17 is not one and seven but 1 ten and 7 ones.
- The activity should be followed by asking the child to write the number in their notebooks along with its expanded form. For example, for 17 as 10 and 7 or  $10 + 7$ .
- Numbers like 51 and 15 or 72 and 27 may be formed to clarify the concept of place value.
- Contexts from children’s daily life experiences can be used to explain the difference.

#### Activity 4 Expand the Number

**This activity provides learning experiences for:**

Visualising a number as a combination of tens and ones.

**Type of Activity:** Whole class



► Place Value Cards

**How to Proceed:**

- Show a number using Number Value Cards, say 67.
- The teacher can ask, how this number is made?



The probable responses of the children can be:

- (a) Child may say six and seven.
  - (b) Child may say seven and six.
  - (c) Child may say sixty-seven.
  - (d) Child may say seventy-six.
- Help the child to reach at the correct response, i.e. (c).
  - In response (a), the child visualises the number as a combination of two digits, not as a combination of tens and ones. Here the teacher needs to remove the overlapped card to show that the number 67 is made up of 60 and 7 and 0 is hidden by the Number Value Card of 7.
  - Response (b) shows the lack of importance of reading the cards in correct direction, which is from left to right. Along with misunderstanding as discussed above, teacher can tell the child about the correct direction.
  - In Response (d), teacher can remove the overlapped card in order to reveal the hidden zero.

**Extension Activity**

- This activity can also be done in pairs, where children can take turns and ask one another to tell the number shown by Place Value Cards and write it in its expanded form also.
- Children can use play money along with the cards where one child can make number using Place Value Cards while

the other can take out the respective notes of ₹ 10 and coins of ₹ 1.

## Activity 5 Who is Big, Who is Small ?

**This activity provides learning experiences for:**

Developing strategies for comparing numbers.

**Type of Activity:** To be done individually by each child.

**How to Proceed:**

- Ask the child to make two digit numbers comprising of digits say 3 and 7 using Place Value Cards. In this case, two digit numbers will be 37 and 73.
- Ask them, “Which number is greater?”
- After adequate practice of such exercise using the material, the teacher may ask the child to identify greater and smaller number without using Place Value Cards. The teacher can help child to identify the greater/smaller number.
- Children can be encouraged to talk about the role of place value in deciding the value of any number.
- Discuss these strategies further.

**Extension Activity**

This activity may also be done with the help of blocks and play money.

## Activity 6 Add, Subtract and Show

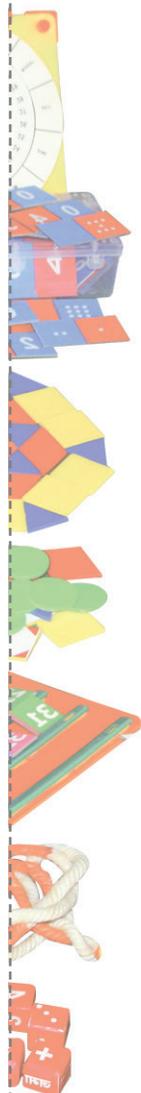
**This activity provides learning experiences for:**

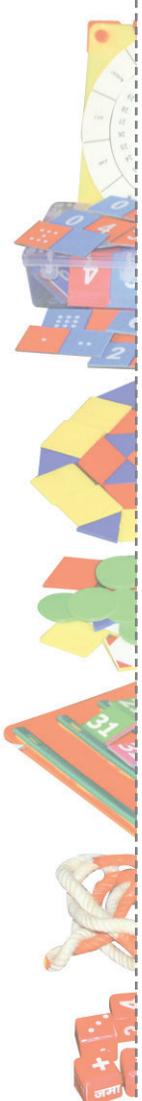
- (i) Developing the vocabulary related to the concepts of addition and subtraction.
- (ii) Strengthening the concepts of addition and subtraction.

**Type of Activity:** Whole class is divided in groups of 4 children.

**How to Proceed:**

- Provide each group with a set of Place Value Cards.
- Ask the children to represent 5 less than a number (say 60) using these cards.
- Once the children are familiar with the words like more than, less than, teacher can use other numbers. For example, ask the children to make number that is 10





▶ Place Value Cards

more than 25. Further asks to add 10 more. This can develop the idea of adding numbers in the tens place without having to do anything to the ones.

- The teacher can ask contextual questions such as how much will be 7 apples more than 54 apples or ₹ 9 less than ₹ 40? Children can represent the answers through Place Value Cards.

## CLOCK

### Concepts Dealt

- Measurement of Time.
- Vocabulary related to Space and Position

### Activity 1 Telling time?

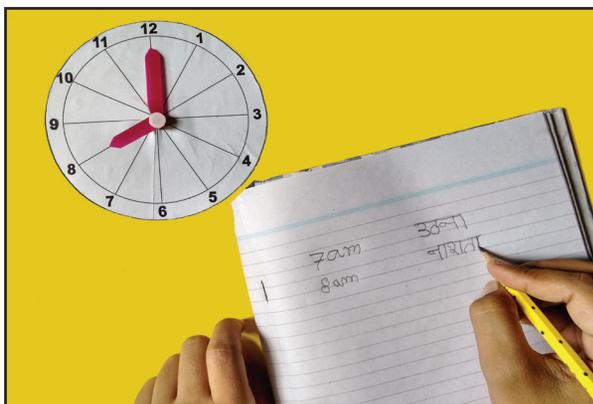
#### This activity provides learning experiences for:

Developing understanding of relationship between time and various everyday activities.

**Type of Activity:** To be done individually by each child.

#### How to Proceed:

- Show time on clock (correct to hour)



- Ask the children what do they usually do at a particular time, for example at 7 O'clock? Child can say – “I come to school at 7 O'clock”, “I take lunch at 12 O'clock” etc. The teacher can show the given time on the clock simultaneously.
- Discussion can also take place on the time taken to do any activity, for example, if they go to play at 5pm and come back at 7pm, then how many hours did they play?

### Activity 2 My Time Table

#### This activity provides learning experiences for:

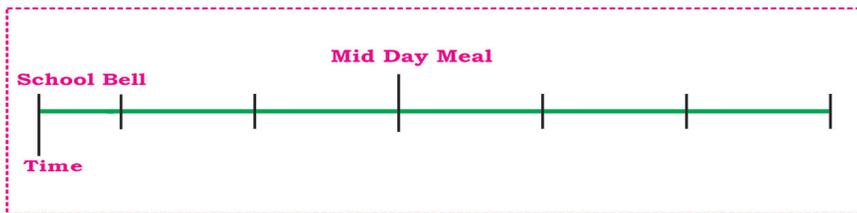
- Organising events of a day in a school in an order.
- Understanding how clock can be used to represent the time of various activities.

▶ Clock

**Type of Activity:** To be done individually by each child.

**How to Proceed:**

- Child is encouraged to share what all activities they do in school? Is there any order to the activities done in the school?
- Teacher can take the discussion further by asking questions such as:
  - At what time you all come to school? Can you show hands of the clock corresponding to the time you come to school?
  - Can you show hands of the clock when your mid-day meal comes?
  - Can you show hands in a clock when you go home?
- Let the children play with clock in pairs and give them opportunities to show the required time using the clock.
- The teacher then take children's attention to how their school day can be broadly divided in two halves, i.e., before and after mid-day meal and how various activities they do in a day can be arranged accordingly.
- Children can place events on a time line (can be drawn by the teacher) on the board.



- Teacher can encourage children to observe how are they following the time table of that particular day and each activity is done on a certain given time.

### Activity 3 Show Me on the Clock

**This activity provides learning experiences for:**  
Representing the activities of the day using a clock.

**Type of Activity:** To be done individually by each child.

**How to Proceed:**

- To begin, the teacher starts by asking child about the various activities and the time around which she/he engages in the given activities. For example, if the child

shares that she/he watched T.V yesterday, then the teacher can ask the child to share the time around which she/he watched the T.V or the timings of the show and simultaneously represent the time on the clock.

- Now, the teacher can encourage children to tell a task from their routine which they like the most. For example, a child may respond lunch break as she/he gets to play with friends. Teacher can also ask the child to show time in clock around which they were engaged in the given activity. Now the teacher asks the child to share other activities she/he would do before and after the lunch break and simultaneously show the time on the clock. This activity may be played in pairs after doing it with individual child. One child can say the activity while other shows the time on the clock.

#### Activity 4 Morning, Afternoon or Evening, Night

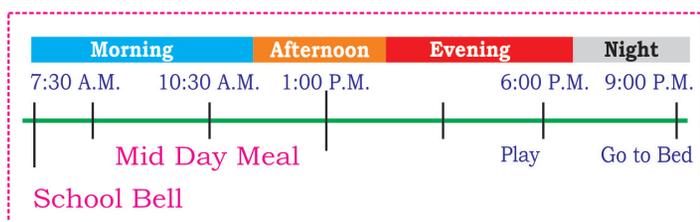
**This activity provides learning experiences for:**

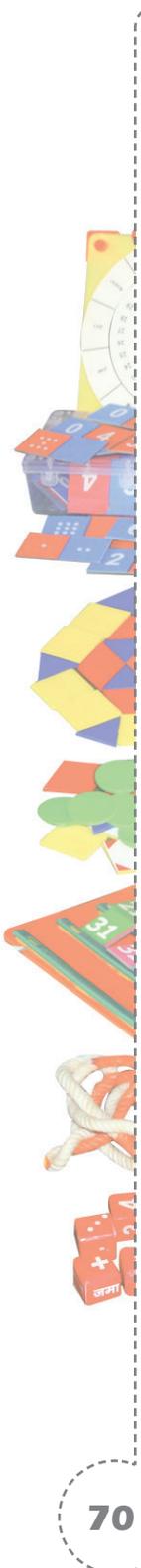
Developing an intuitive understanding how daily activities can be broadly organised on the basis of time into morning, afternoon, evening and night.

**Type of Activity:** To be done individually by each child.

**How to Proceed:**

- The teacher can start this activity by asking questions such as:
  - What do you do at 7 o'clock in the morning?
  - What do you do at 7 o'clock in the evening?
  - What time do they have lunch?
  - What time do you go back from school?
  - What do you do around 6 o'clock in the evening?
  - What time do they go to sleep?
- Teacher simultaneously keeps recording student’s responses on the time line as shown below:





▶ Clock

- Teacher can further help children classify the activities in four major divisions of a day, i.e., morning, afternoon, evening and night.

### **Activity 5** What takes More Time?

**This activity provides learning experiences for:**

Understanding how the nature of the activity impacts the time taken to complete it.

**Type of Activity:** Whole class is divided in two groups.

**How to Proceed:**

- Pose a challenge like, “Let’s see who takes more time” and give task like filling water in a container. She/he gives each team a container of different size.
- Teacher should ensure that each group has two activities such as filling water in two containers of different sizes. One of the group members can volunteer in the activity for filling the container. Each team will take turn to do the activity where the members of the other group keep a record of the time taken by counting till the activity ends. The other group takes their turn to do the act. At the end, children need to discuss the time taken by each group in terms of number of counts.

### **Activity 6** Play Time

**This activity provides learning experiences for:**

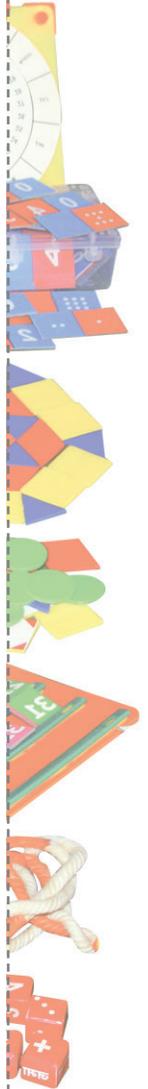
- (i) Understanding how time can be used to estimate duration of an event.
- (ii) Drawing inferences from the information.

**Type of Activity:** Whole class is divided in groups of 3-4 children

**How to Proceed:**

- Encourage children to discuss the different activities they do after school.
- After discussion, teacher can give any one of the following questions to each group:
  - How many hours do you play?
  - How many hours do you watch T.V.?

- How many hours do you sleep?
- How many hours do you study? etc.
- Each group now needs to ask the given questions to at least 10 children from their class. Children are encouraged to organise the information they have collected and present their report in front of the class. Children can also use clock while presenting the data.



## STRING

### Concepts Dealt

- Measurement of Length.
- Vocabulary related to Space and Position.

### Activity 1 Measuring Length

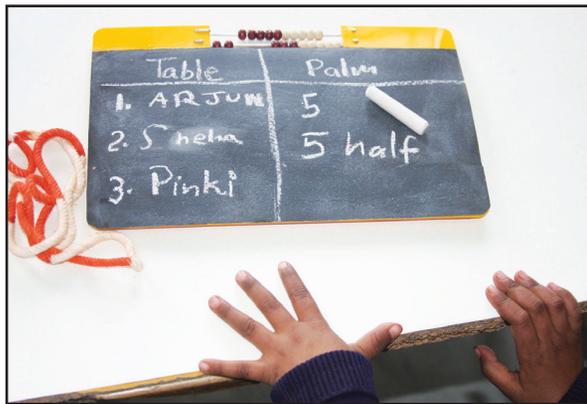
**This activity provides learning experiences for:**

- (i) Developing skill of estimating length.
- (ii) Developing skill of measuring length.
- (iii) Realising the need for standard units of length.

**Type of Activity:** To be done individually by each child.

#### How to Proceed:

- Encourage the child to first estimate the length of the table or any object in the context of their hand span.
- Encourage the child to measure the length of a table or any object present in the class with their hand span and record it. Teacher herself/himself can also measure the length of the table using her/his hand span.



- Each child shares the length they have measured. They are encouraged to compare their findings with other.
- As the size of each child's hand span will be different, the teacher can take the discussion towards the need of standard unit for measuring length.
- Child can now be asked to measure length using the string.
- Initiate discussion in the class on why they got same measurement by string and not by hand span.

## Activity 2 Measure Objects

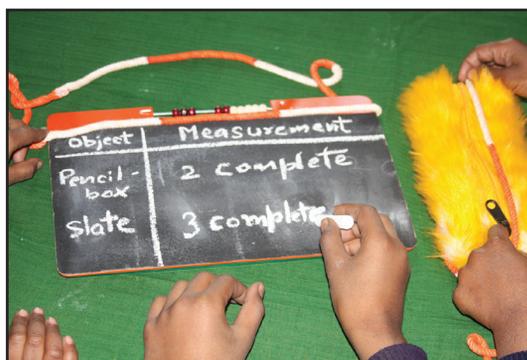
**This activity provides learning experiences for:**

- (i) Developing the skill of estimation.
- (ii) Developing the skill using non-standard units.

**Type of Activity:** To be done individually by each child.

**How to Proceed:**

- The teacher can ask each child to measure various objects like desk, blackboard, notebooks, door, floor, etc., using the string.



- Children can keep a record of it in their notebooks:

Object	Measurement with string
Table	3 complete strings and more
Board	2 complete strings and more

- Teacher can later use this data for data handling by asking questions like
  - Which object is the ‘longest’?
  - Which two objects are approximately of same length?

## Activity 3 Estimation

**This activity provides learning experiences for:**

Developing estimation skills.

**Type of Activity:** To be done individually by each child.

**How to Proceed:**

- The teacher can ask the child to estimate the length of any object e.g., table, assuming the given string as unit length.

▶ String

- Child can keep a record of it in the notebook.
- Now, the teacher can ask the child to measure the object using string to find its actual length. Child can keep the record of it in her/his notebook:

Object	Estimated length	Actual length
Table	4 strings	5 complete and more
Floor	6 strings	8 complete
Curtain		
Window	3 strings	3 strings
Door		
:		
:		

## STRING GAMES

**This activity provides learning experiences for:**

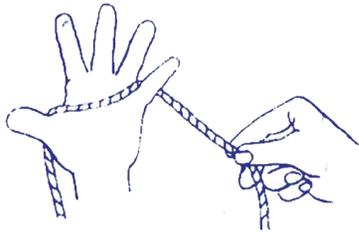
- Developing the spatial vocabulary and their meaning like: in, out, left, right, top, bottom, middle, etc.
- Developing logical thinking and reasoning.

**Type of Activity:** To be done individually by each child.

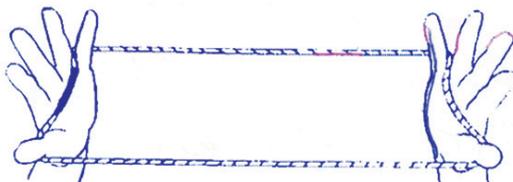
### 1. STRING IN FINGERS

**How to Proceed:**

- There are many games that can be played using string. For playing the simplest one, instructions are:
  - Hold a loop of string in your right hand and place it behind and around your left thumb and little finger.



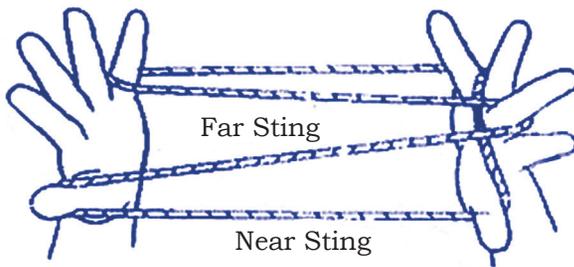
- Repeat the above step with the right hand.



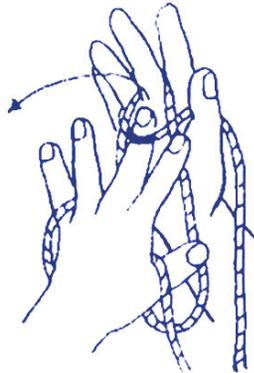
- (iii) Now bring your right middle finger to scoop up the string from your left palm and pull the string.



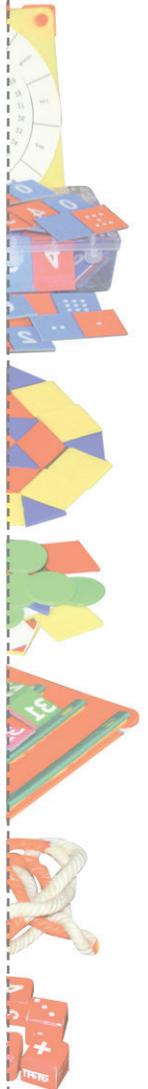
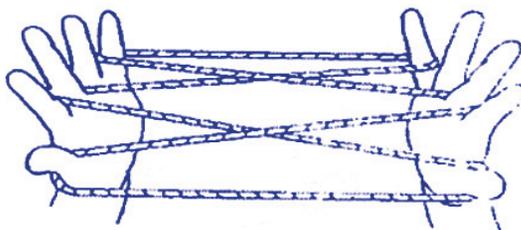
- (iv) Both your hands will now be in this position.



- (v) With your left middle finger scoop up the string from your right palm and pull the string back.

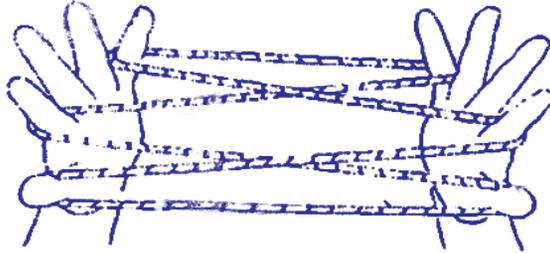


- (vi) This is called the Middle Finger Base.



▶ String

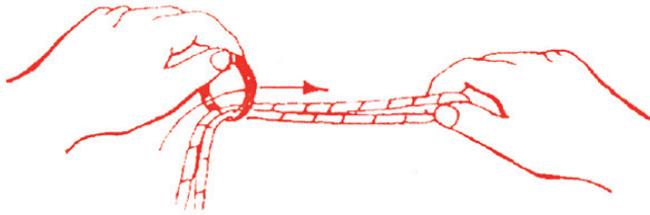
- (vii) Instead of using the middle finger, you can use both your index fingers, to make the Index Finger Base.



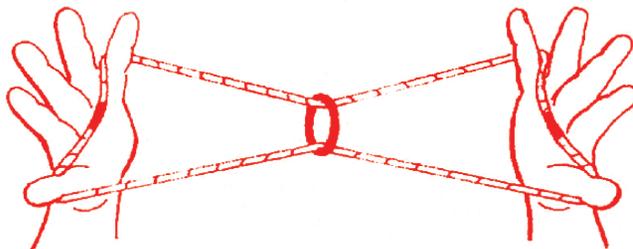
## 2. STRING IN A RING

### Instructions:

- (i) Put one end of a loop of string inside a ring. Pull the string to bring the ring in the middle.

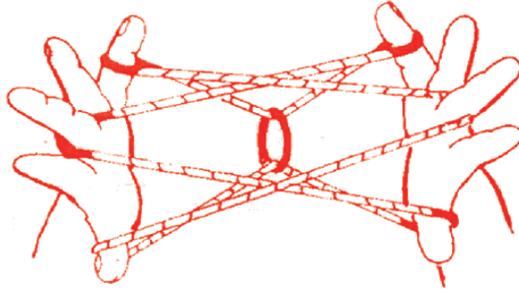


- (ii) Now loop the string across both your palms and behind your little fingers and thumbs.

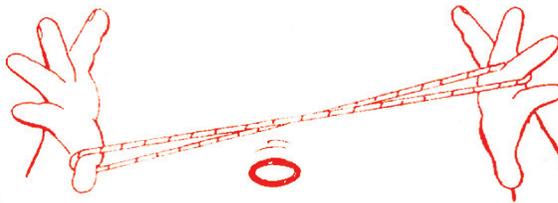


- (iii) Pick up the left palm string with your right middle finger and the right palm string with your left middle finger.

- (iv) Now release the string of little fingers, the left middle finger and the right thumb.



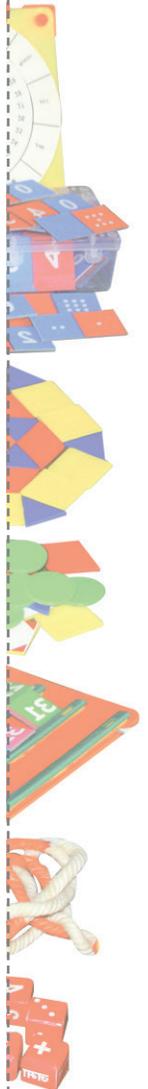
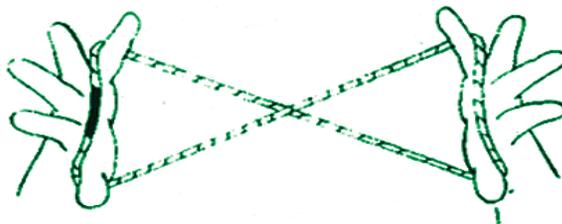
- (v) Be careful not to release the right middle finger and left thumb strings. On pulling your hands apart, the ring will get free.



### 3. THUMB TRAP

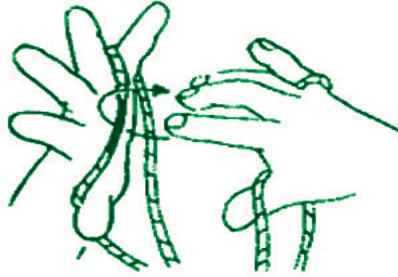
#### Instructions:

- (i) Put the string in the thumbs and little fingers of a hand. Give the loop a twist to make a cross in the middle. Now put the other end of the string in the thumb and little finger of other hand.

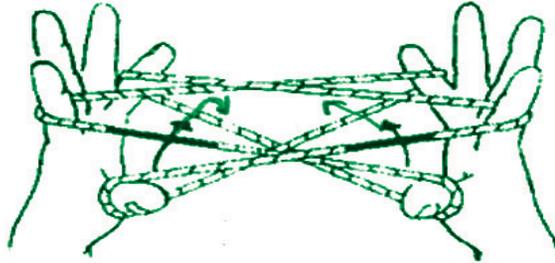


▶ String

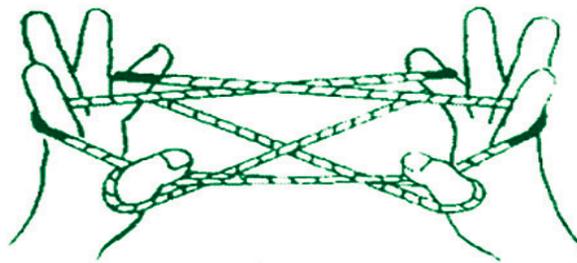
- (ii) Now lift the left palm string with your right index finger. Lift the right hand palm string with your left index finger.



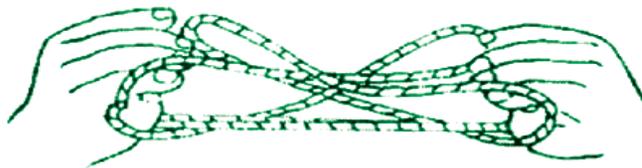
- (iii) Put your thumbs into the loop as shown in the picture.



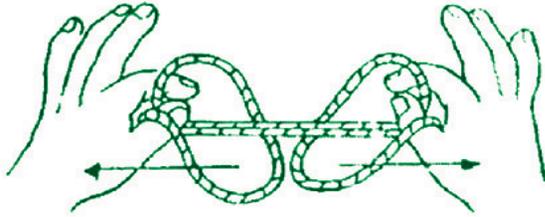
- (iv) Release the index and little finger strings of both the hands.



- (v) Bend your hands inwards.



(vi) Pull your hands apart as far as they will go.



(vii) You will be surprised that both your thumbs are trapped in the loop of string.

