

LESSON PLAN 9

CLASS : 8 TEACHER'S NAME :

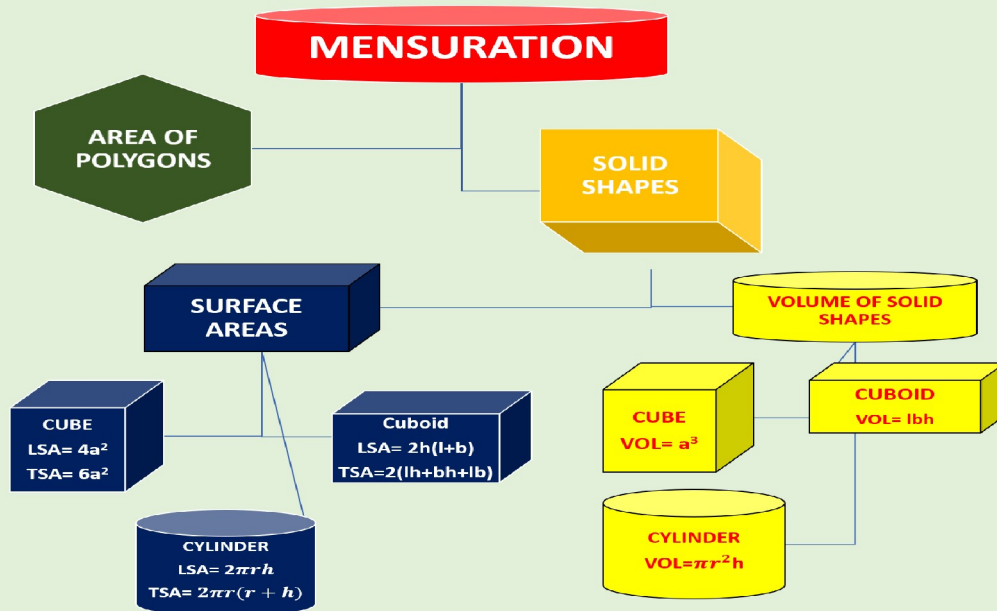
NAME OF THE UNIT	SUB-TOPICS	NO OF PERIODS REQUIRED			Time line for teaching	
		Teaching	Practice	TOTAL	From	To
MENSURATION	9.1 INTRODUCTION	2	2	4		
	9.2 AREA OF A POLYGON					
	9.3 SOLID SHAPES	3	4	7		
	9.4 SURFACE AREA OF A CUBE, CUBOID AND CYLINDER					
	9.4.1 CUBOID 9.4.2 CUBE 9.4.3 CYLINDER					
	9.5 VOLUME OF A CUBE, CUBOID AND CYLINDER	3	4	7		
9.5.1 CUBE						
9.5.2 CUBOID 9.5.3 CYLINDER						
9.6 VOLUME AND CAPACITY						
TOTAL	8	10	18			
	KEY CONEPTS	KEY VOCABULARY				
PRE-REQUISITES	Every Pupil is expected to have basic knowledge in # different types of polygons like triangle, quadrilateral # finding area of Triangle, Quadrilateral, Trapezium, Rectangle, Square,Rhombus etc., # mathematical operations like +, -, x, ÷ # solid shapes Prism and Pyramid # discriminating between Area and Volume # visualizing solid shapes like cube, cuboid and cylinder and their parts	# Mensuration # Perimetre # Area, Pathways # Polygon # Trapezium # border # surface area,Volume # Right circular cylinder			# Pentagon # hexagon # Solid Shape # Dimension # Prism,Pyramid # Cube, Cuboid, Cylinder # Capacity	

LEARNING OUTCOMES

- After Completion of this lesson every student will be able to
- # calculate the area of a polygon by sub dividing it into different polygons
 - # find the Lateral surface area and Total surface area of the Cube, Cuboid and Cylinder
 - # discriminate between Area and Volume
 - # find the volume of solid shapes like cube, cuboid and cylinder
 - # utilize the formulae of volume and area in sums related to real life circumstances.
 - # recognize the significance and appreciate the importance of Mensuration in real life situations.

Teaching Learning Process

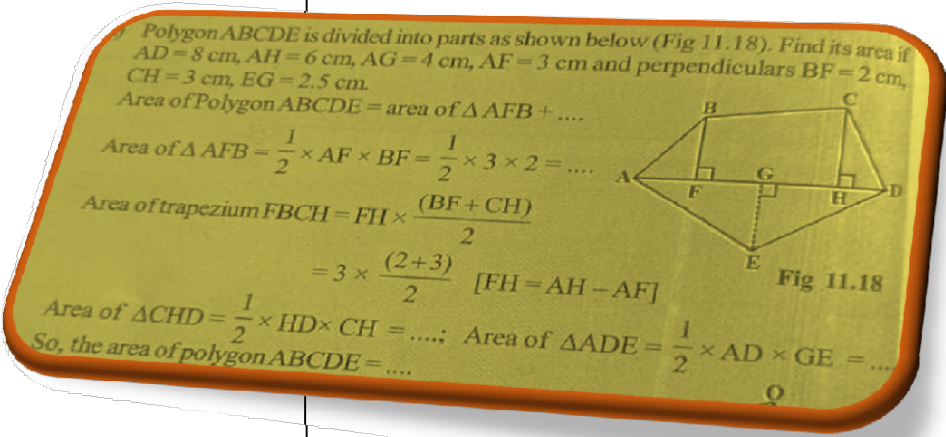
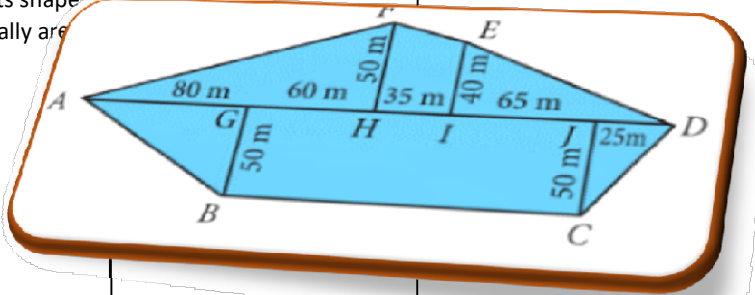
MIND MAPPING

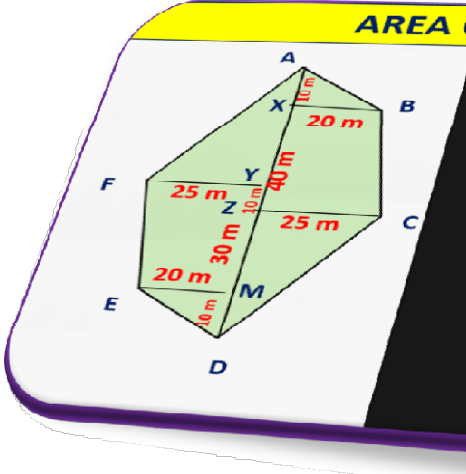


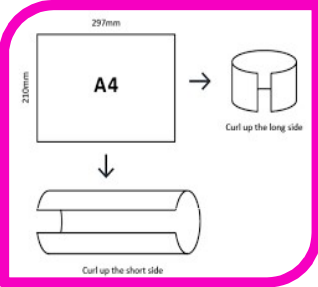
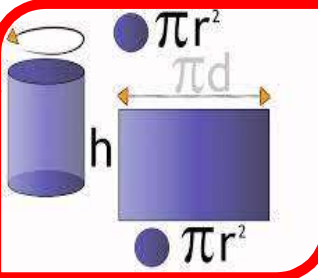
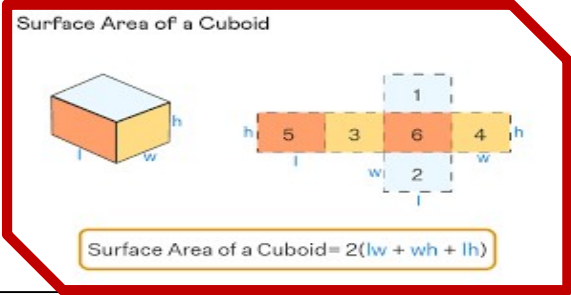
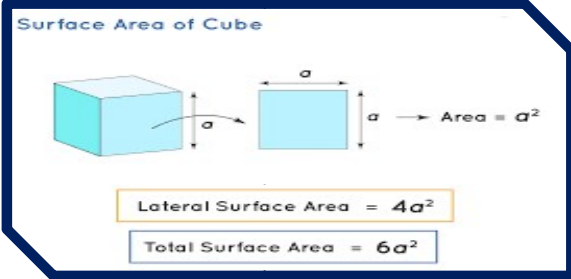
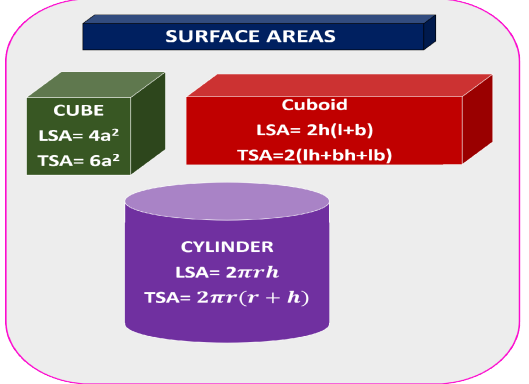
Experience & Reflection

Pupils will recollect their knowledge on Visualizing solid shapes and finding areas of various 2 D objects from their previous class and will utilize here to explore and find out the areas of polygons and solid shapes and volumes of solid shapes

Students will experience the usage of Mensuration in real life situations.

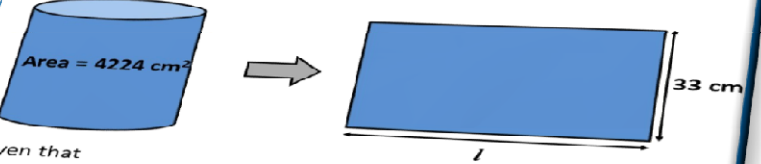
TEACHING PERIOD : 1,2	INTRODUCTION, AREA OF A POLYGON		
CONCEPTS/STEPS	TEACHER ACTIVITY (I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY (YOU DO)
KEY WORDS & PRE REQUISITES	Brain storming session involving children with pre-requisites vocabulary and concepts related to previous knowledge. Introduction of new vocabulary and key words associated with the concept # Mensuration # Perimetre # Area, Pathways # Polygon # Trapezium # border	* Students read the pre-requisites and answer the questions to the teacher (whole class activity)	Every Pupil will read and write the key words in their note books
MIND MAPPING	Teacher writes the key word "MENSURATION " on the black board and will elicit its other related words through questioning and will draw pupils' attention towards key concepts in the lesson	Heterogeneous groups are created. One group will read the words and other will explain the meaning	Pupils individually read the keywords associated with the chapter
CONCEPTUAL UNDERSTANDING & LEARNING ACITIVITY	Teacher recalls previous knowledge of children on Quadrilaterals and their areas and will draw their attention towards finding areas of different fields in the shape of polygons. Teacher illustrates the way of finding area using some exemplary model sums and engages children in an activity by dividing them into groups. Here teacher gives a polygon shaped field with measurements to each group and will instruct each group to sub divide the given polygon into different parts like trapezium, triangle, rectangle depending upon its shape among their group members and find the areas individually and finally are needed to add the total area of the polygon.	Heterogeneous groups are formed to participate in the activities	Each student in the group participates in the activities and learns the concepts of converting ratios into percentages and vice versa along with finding discounts
			
SUMMARY	Teacher writes the summary of the concept in a step wise procedure and asks children to note and read	pupils will note down and read the summary in groups	every individual reads the summary and notes it down
ASSESSMENT	Teacher asks children to solve the sums of try these section, Think Discuss & Write along with example sums and exercise sums of 9.1	every group will do the sums by discussion among each other	every individual solves the sums on their own

PRACTICE PERIOD: 1,2	INTRODUCTION, AREA OF A POLYGON		
CONCEPTS/STEPS	TEACHER ACTIVITY (I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY (YOU DO)
KEY WORDS READING	Teacher writes the key words from previous class's teaching period and asks children to read and write them in note books # Mensuration # Perimetre # Area, Pathways # Polygon # Trapezium # border	Whole class activity : one child comes to the board and reads the key words loudly and the remaining class follows.	Every child comes to the board and reads the key words and notes them down in their note books
SIMILAR LINES READING	Teacher finds the area of a polygon shaped field by an exemplary illustration and asks children to find some more by watching similar lines.	Each group will read the similar lines and will frame some more by discussion	Every Individual prepares their own similar lines using the lines prepared by the teacher
	<div style="border: 2px solid purple; border-radius: 15px; padding: 10px; background-color: #f0f0f0;"> <p style="text-align: center; color: blue; font-weight: bold; margin: 0;">AREA OF A POLYGON SHAPED FIELD</p>  <div style="background-color: black; color: white; padding: 10px; margin-top: 10px;"> <p>Area of Polygon ABCDEF = Area of $\triangle ABX$ + Area of $\triangle XBCZ$ + Area of $\triangle CZD$ + Area of $\triangle DME$ + Area of $\triangle EMYF$ + Area of $\triangle AFY$</p> $= \frac{1}{2}XB \cdot AX + \frac{1}{2}XZ(XB + ZC) + \frac{1}{2}CZ \cdot ZD + \frac{1}{2}DM \cdot ME + \frac{1}{2}MY(EM + FY) + \frac{1}{2}AY \cdot FY$ $= \frac{1}{2}20 \times 10 + \frac{1}{2}40(20 + 25) + \frac{1}{2}25 \times 40 + \frac{1}{2}10 \times 20 + \frac{1}{2}40(20 + 25) + \frac{1}{2}40 \times 25$ $= 100 \text{ m}^2 + 900 \text{ m}^2 + 500 \text{ m}^2 + 100 \text{ m}^2 + 900 \text{ m}^2 + 500 \text{ m}^2$ $= 3000 \text{ m}^2$ </div> </div>		
SUMMARY/ SYNOPSIS	Teacher once again writes important key words and summary of the concept and asks children to read,note down and practice.	pupils will note down and read the summary in groups	every individual spells and reads the summary and notes it down
WRITING/ EDITING	Teacher guides children in doing sums of exercise 8.1 on their own and checks their writings	One group will check the writings of the other and vice versa	Slow learners are focused and teacher will ascertain that every individual learns the concept in the forth coming practice sessions

TEACHING PERIOD : 3 TO 5		SOLID SHAPES, SURFACE AREA OF A CUBE, CUBOID AND CYLINDER, CUBOID, CUBE, CYLINDER	
CONCEPTS/STEPS	TEACHER ACTIVITY (I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY (YOU DO)
KEY WORDS	Brain storming session involving children with key words # surface area, Volume # Right circular cylinder # Solid Shape # Dimension # Prism, Pyramid # Cube, Cuboid, Cylinder	Students read the keywords answer the questions to the teacher (whole class activity)	Every Pupil will read and write the key words in their note books
CONCEPTUAL UNDERSTANDING  	Teacher first recalls pupils' knowledge on different solid shapes like cube, cuboid and cylinder which they were familiar with in their previous classes. Later teacher conducts an interesting activity involving heterogeneous groups where teacher provides some different solid models of cube, cuboid and cylinder and asks children to touch their surfaces and find the area of each surface. As since the surfaces of a cube and cuboid are all either squares or rectangles, pupils can easily find the Four wall surface area or Lateral surface area (LSA) and Total surface area (TSA) of these solid shapes. Later teacher conducts another activity by taking A4 sheet of paper and rolls it into make a cylinder. Teacher marks the various measures like height, base radius of the cylinder on it. Now teacher unrolls the cylinder to bring it back into the shape of a rectangle. As since pupils are aware with the area of rectangle and perimeter of a circle, teacher draws the formulae of surface areas of cylinder by eager questioning. 	pupils are divided into heterogeneous groups and engaged in the activity  	Each student in the group participates in the activity and learns the concept
LEARNING ACTIVITY			
SUMMARY	Teacher once again writes important key words and summary of the concept and asks children to note down and adopt.	Pupils will note down and read the summary in groups	Every individual reads the summary and notes it down and adopts the procedure
ASSESSMENT	Teacher gives some questions from Try These sections as well as sums from exercise 9.2 and examples as well and asks children to do those sums	Every group will do the sums by discussion among each other	Every individual solves the sums on their own

PRACTICE PERIODS: 3 TO 6	SOLID SHAPES, SURFACE AREA OF A CUBE, CUBOID AND CYLINDER, CUBOID, CUBE, CYLINDER		
CONCEPTS/STEPS	TEACHER ACTIVITY (I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY (YOU DO)
KEY WORDS READING	Teacher writes the key words from previous class's teaching period and asks children to read and write them in note books # surface area, Volume # Right circular cylinder # Solid Shape # Dimension # Prism, Pyramid # Cube, Cuboid, Cylinder	Whole class activity : one child comes to the board and reads the key words loudly and the remaining class	Every child comes to the board and reads the key words and notes them down in their note books
SIMILAR LINES READING	Teacher finds the surface areas of some sums related to solid shapes like cylinder and asks children to solve some more by watching similar lines	Each group will read the similar lines and will frame some more by watching them	Every individual will watch the similar lines and will frame some more
SUMMARY/ SYNOPSIS	Teacher once again writes important key words and summary of the concepts covered and asks children to note down and adopt.	Pupil groups will read and adopt the procedure	Teacher focuses on every individual so that each one learns the concept in successive upcoming practice sessions
WRITING/ EDITING	Teacher gives some questions from Try These sections and guides them in doing some sums of examples and exercise 9.2 and teacher checks the writings of children	One group will check the writings of the other and vice versa	

The lateral surface area of a hollow cylinder is 4224 cm^2 . It is cut along its height and formed a rectangular sheet of width 33 cm. Find the perimeter of rectangular sheet?



Given that
 Hollow cylinder is converted into a rectangular sheet

So, Area of cylinder and sheet must be the same
 \therefore Curved Surface Area of hollow cylinder = Area of rectangular sheet
 $4224 = \text{Length} \times \text{Breadth}$

Given: Lateral surface area of hollow cylinder = 4224 cm^2
 and Height of hollow cylinder = 33 cm
 Curved surface area of hollow cylinder = $2\pi rh$

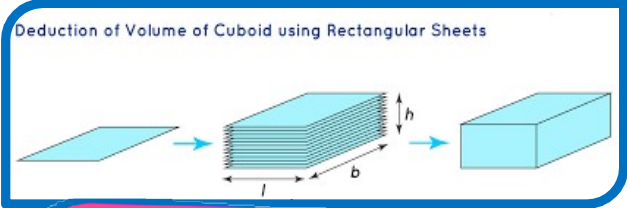
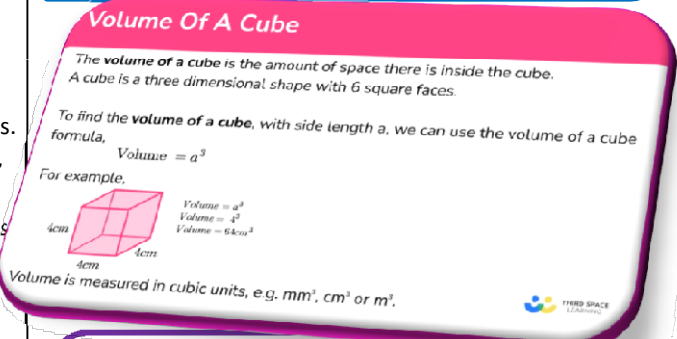
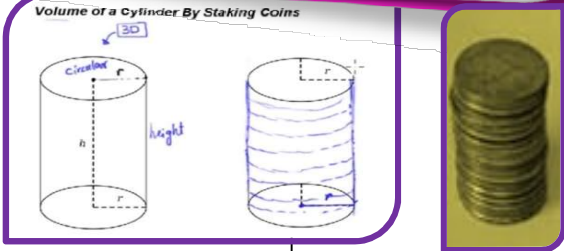
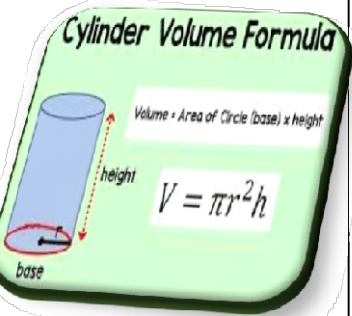
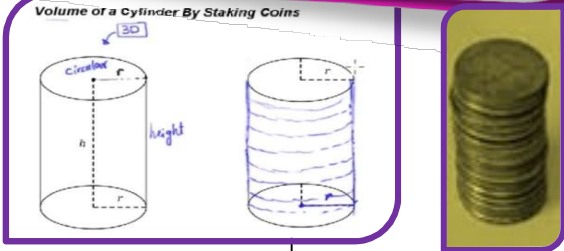
$$\Rightarrow 4224 = 2 \times \frac{22}{7} \times r \times 33$$

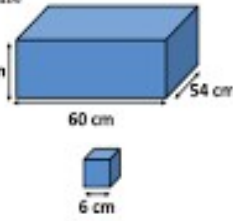
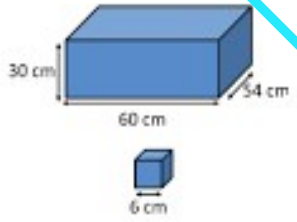
$$\Rightarrow r = \frac{4224 \times 7}{2 \times 22 \times 33} = \frac{64 \times 7}{22} \text{ cm}$$

Now Length of rectangular sheet = $2\pi r$

$$\Rightarrow l = 2 \times \frac{22}{7} \times \frac{64 \times 7}{22} = 128 \text{ cm}$$

Perimeter of rectangular sheet = $2(l + b)$
 $= 2(128 + 33) = 2 \times 161 = 322 \text{ cm}$

TEACHING PERIOD : 6 to 8		VOLUME OF A CUBE, CUBOID AND CYLINDER, CUBE, CUBOID, CYLINDER, VOLUME AND CAPACITY	
CONCEPTS/STEPS	TEACHER ACTIVITY (I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY (YOU DO)
KEY WORDS	Brain storming session involving children with key words # Cube, Cuboid, Cylinder # Capacity # Volume	* Students read the key words and answer the	Every Pupil will read and write the key words in their note books
CONCEPTUAL UNDERSTANDING	<p>Teacher conducts a questioning activity involving children where teacher brings a bundle of A4 sheets and first places one A4 sheet on the table and asks children to find the area of the sheet and gets the answer as ' l x b ' easily as they are aware of the area of a rectangle.(Infact A4 sheet is not a rectangle, it is a cuboid with negligible height) . Now teacher places one more A4 sheet on the previous sheet and asks the total area occupied by the both sheets. Children will easily say "2lb". Here onwards teacher places sheets one by one on the previous and questions children about the total area occupied by all the sheets if they are "h" in number. Children will easily say "hlb" or "lbh". Here teacher explains that the total place occupied by 'h' sheets each of area 'lb' is nothing but the Volume or capacity of the cuboid formed with dimensions l,b,h.</p> <p>In this same fashion teacher introduces the volume of cube also as "a^3" Later teacher conducts similar activity with some one rupee congruent coins. By placing one coin on the table teacher asks the area occupied by the coin, Children will easily say the answer as "πr^2" as since it looks like a circle. (Infact coin is not a circle, it is a cylinder of negligible height). Teacher places one more coin on it and asks children to find the total area occupied by both and will get an answer as "$2 \pi r^2$". Teacher repeats this activity for some more coins and asks children if he places "h" coins one on another what could be the place occupied by all of them. Children will obviously come out with the answer "$h \pi r^2$" or "$\pi r^2 h$". With this teacher gives an explanation as of how the volume of a right circular cylinder can easily be found out. Later teacher provokes children to explore the other ways of finding volume of cube, cuboid and cylinder by providing some modals of each.</p>	<p>Heterogeneous groups are created and are engaged in activities</p>  <p>Deduction of Volume of Cuboid using Rectangular Sheets</p>  <p>Volume Of A Cube</p> <p>The volume of a cube is the amount of space there is inside the cube. A cube is a three dimensional shape with 6 square faces.</p> <p>To find the volume of a cube, with side length a, we can use the volume of a cube formula,</p> $\text{Volume} = a^3$ <p>For example,</p>  <p>Volume of a Cylinder By Staking Coins</p>	<p>Every child participates in the activity and understands the concept</p>
LEARNING ACTIVITY	 <p>Cylinder Volume Formula</p> <p>Volume = Area of Circle (base) x height</p> $V = \pi r^2 h$	 <p>Volume of a Cylinder By Staking Coins</p>	
SUMMARY	Teacher writes the summary of the concept discussed and asks children to read, note down and adopt	pupils will note down and read the summary in groups	every individual reads the summary and notes it down and adopts the procedure
ASSESSMENT	Teacher gives some questions from Try These section and exercise sums of 9.3 and asks children to solve those sums	every group will do the sums by discussion among each other	every individual solves the sums on their own

PRACTICE PERIODS: 7 to 10		VOLUME OF A CUBE, CUBOID AND CYLINDER, CUBE, CUBOID, CYLINDER, VOLUME AND CAPACITY	
CONCEPTS/STEPS	TEACHER ACTIVITY (I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY (YOU DO)
KEY WORDS READING	Teacher writes the key words from previous class's teaching period and asks children to read and write them in note books # Cube, Cuboid, Cylinder # Capacity # Volume	Whole class activity : one child comes to the board and reads the key words loudly	Every child comes to the board and reads the key words and notes them down in their note
SIMILAR LINES READING	Teacher finds the volume in the case of some exemplary sums associated with solid shapes like cylinder, cuboid and cube and asks children to solve some more by watching similar lines	Each group will read the similar lines and will solve some more by discussion	Every Individual prepares their own similar lines using the lines prepared by the teacher
	<p>A cuboid is of dimensions 60 cm X 54 cm X 30 cm. How many small cubes with side 6 cm can be placed in the given cuboid?</p> <p>So, Volume of cuboid = Number of cubes × Volume of 1 cube</p> $\text{Number of cubes} = \frac{\text{Volume of cuboid}}{\text{Volume of 1 cube}}$ <p>Volume of cuboid</p> $\text{Volume} = l \times b \times h$ $= 60 \times 54 \times 30$ $= 6 \times 54 \times 3 \times 100$ $= 18 \times 54 \times 100$ $= 972 \times 100$ $= 97200 \text{ cm}^3$ 	<p>Volume of cube</p> $\text{Volume} = (\text{Side})^3$ $= 6 \times 6 \times 6$ $= 216 \text{ cm}^3$ <p>Now,</p> $\text{Number of cubes} = \frac{\text{Volume of cuboid}}{\text{Volume of 1 cube}}$ $= \frac{97200}{216}$ $= \frac{16200}{36} = \frac{2700}{6}$ $= 450$ <p>450 small cubes can be placed in cuboid.</p> 	
SUMMARY/ SYNOPSIS	Teacher once again writes important key words and summary and asks children to read ,note down and adopt.	Pupil groups will read the summary and utilize	Teacher focuses on every individual so that each one knows and adopts the concept learnt in successive upcoming practice sessions
WRITING/ EDITING	Teacher asks children to solve the sums of exercise 9.3 on their own and teacher checks the writings of children	One group will check the writings of the other and vice versa	