

CHAPTER-13

Surface Areas & Volumes

Task-1: Worksheet

Topic	Surface Areas and Volumes
Nature of Task	Pre-content Oriented
Content Coverage	—
Learning Objective	<ul style="list-style-type: none"> • To be able to find out the total surface area of cube, cuboid, cylinder, cone, sphere. • To differentiate the curved surface area from total surface area. • To identify the kind of area required according to the problem.
Execution of Task	Coloured papers can be distributed to each student. Class can be divided into groups each containing 4 to 5 students. Let them discuss, brain storm and solve the problems.
Duration	2 Consecutive Periods
Criteria for Assessment	Teacher can observe each group to see that every child is taking interest and is participating. Every group is making effort to solve the problem. Students can be assessed on attributes of thinking, social and emotional skills.
Follow up	Discuss response of each group and appreciate the students for their enthusiasm, involvement and other remarkable behaviours noticed.



Task-2: MCQ Worksheet

Topic	Surface Areas and Volumes
Nature of Task	Content
Content Coverage	—
Learning Objective	<ul style="list-style-type: none"> To be able to find out the total surface area of cube, cuboid, cylinder, cone, sphere. To differentiate the curved surface area from total surface area. To identify the kind of area required according to the problem. To be able to find out the volume of cube, cuboid, cylinder, cone, sphere.
Execution of Task	30 Minutes time can be allotted to conduct MCQ. Teacher can take round to see that every student is doing calculations in rough and not simply guessing.
Duration	2 Periods
Criteria for Assessment	2 marks for correct response and no marks for incorrect response.
Follow up	Discuss the answers after checking the MCQ and give home assignment for more drill.

Suggestive Multiple Choice Questions

[Use $\pi = \frac{22}{7}$ unless otherwise stated]

- If the dimensions of a cuboid are 3 cm, 4 cm and 10 cm, then its surface area is
 A. 82 cm^2 B. 123 cm^2 C. 164 cm^2 D. 216 cm^2
- The volume of the cuboid in Q.1 is
 A. 17 cm^3 B. 164 cm^3 C. 120 cm^3 D. 240 cm^3
- The surface area of a cuboid is 1372 sq. cm. If its dimensions are in the ratio of 4 : 2 : 1, then its length is
 A. 7 cm B. 14 cm C. 21 cm D. 28cm
- The base radius and height of a right circular cylinder are 7 cm and 13.5 cm. The volume of cylinder is
 A. 1579 cm^3 B. 1897 cm^3 C. 2079 cm^3 D. 2197 cm^3



5. The base radius of a cone is 5 cm and its height is 12 cm. Its slant height is
A. 13 cm B. 19.5 cm C. 26 cm D. 52cm
6. The curved surface area of a cylinder of height 14 cm is 88 sq. cm. The diameter of the cylinder is
A. 0.5 cm B. 1.0 cm C. 1.5 cm D. 2.0 cm
7. The lateral surface area of a right circular cone of height 28 cm and base radius 21 cm is
A. 1155 cm^2 B. 1055 cm^2 C. 2110 cm^2 D. 2310 cm^2
8. The circumference of the base of a 8 m high conical tent is $\frac{264}{7} \text{ m}^2$. The area of canvas required to make the tent is
A. $\frac{1360}{7} \text{ cm}^2$ B. $\frac{1360}{14} \text{ cm}^2$ C. 286 cm^2 D. 98 cm^2
9. The area of metal sheet required to make a closed hollow cone of height 24 m and base radius 7 m is
A. 176 m^2 B. 352 m^2 C. 704 m^2 D. 1408 m^2
10. The diameter of a sphere whose surface area is 346.5 cm^2 is
A. 5.25 cm B. 5.75 cm C. 11.5 cm D. 10.5 cm
11. The radius of a spherical baloon increases from 7 cm to 14 cm when air is pumped into it. The ratio of the surface area of original baloon to inflated one is
A. 1 : 2 B. 1 : 3 C. 1 : 4 D. 4 : 3
12. The circumference of the base of a cylindrical vessel is 132 cm and its height is 25 cm. If $1000 \text{ cu.cm} = 1 \text{ liter}$, the number of litres, of water the vessel can hold is
A. 17.325 B. 34.65 C. 34.5 D. 69.30
13. The number of litres of milk a hemispherical bowl of radius 10.5 cm can hold is
A. 2.47 B. 2.476 C. 2.376 D. 3.476
14. The number of bricks, each measuring $18 \text{ cm} \times 12 \text{ cm} \times 10 \text{ cm}$ are required to build a 1 wall $12 \text{ m} \times 0.6 \text{ m} \times 4.5 \text{ m}$ if $\frac{1}{10}$ of its volume is taken by mortar, is
A. 15000 B. 13500 C. 12500 D. 13900
15. The radius of a sphere is 10 cm. If its radius is increased by 1 cm, the volume of the sphere is increased by
A. 13.3% B. 21.1% C. 30% D. 33.1%



Task-3: Home Assignment

Topic	Surface Areas and Volumes
Nature of Task	Content
Content Coverage	Complete Chapter
Learning Objective	To apply the knowledge gained in 'Surface Area and Volumes' in solving the question.
Execution of Task	For extra practise of content taught, home assignment can be given after the completion of Chapter.
Duration	2 to 3 days
Criteria for Assessment	Follow CW / HW assignment rubric
Follow up	Class Discussion. Answers to the questions may be discussed in class room and individual queries may be answered.

Home Assignment

- The dimensions of a prayer Hall are $20 \text{ m} \times 15 \text{ m} \times 8 \text{ m}$. Find the cost of painting its walls @ Rs. 10 per sq. m.
- Find the curved surface area of a right circular cylinder whose height is 13.5 cm and radius of its base is 7 cm. Find also its total surface area.
- The exterior diameter of an iron pipe is 25 cm and it is one cm thick. Find the whole surface area of the pipe it is 21 cm long.
- A roller 150 cm long has a diameter of 70 cm. To level a playground it takes 750 complete revolutions. Determine the cost of levelling the playground at the rate of 75 paise per sq. metre.
- Find the total surface area of a cone, if its slant height is 21 m and the diameter of its base is 24 m.
- The volume of a sphere is 4851 cm^3 . How much should its radius be reduced so that its volume becomes $\frac{4312}{3} \text{ cm}^3$.
- A river, 3 m deep and 40 m wide, is flowing at the rate of 2 km/hour. How much water will fall into the sea in a minute ?
- Find the capacity, in litres, of a conical vessel whose diameter is 14 cm and slant height is 25 cm.
- What is the total surface area of a hemisphere of base radius 7 cm?
- A village having a population of 4000, requires 150 litres of water per head per day. It has a tank measuring $20 \text{ m} \times 15 \text{ m} \times 6 \text{ m}$. For how many days, the water of the tank will be sufficient for the village ?



Task-4: Oral Assessment

Topic	Surface Area and Volumes
Nature of Task	Content Oriented
Learning Objective	<ul style="list-style-type: none"> To be able to tell the formulae, units for different types of solids. To calculate the same mentally for simple problems. To recognise the need of finding curved surface area, total surface area or volume after reading the word problems.
Execution of Task	Teacher can prepare the slips of questions based on above LO's and put them in basket. Students can be called one by one and must read the question loudly and respond to it. If he/she is not able to respond next child can be called. These students may get the chance in the end or in somebody's turn, followed by a small complete the table for students requiring more practice.
Duration	1 Period
Criteria for Assessment	1 marks for correct response and no marks for incorrect response.

Suggestive Oral Questions–Volume and Surface Areas

- The volume of a cuboid of dimensions l , l and h is _____ unit^3 .
- The surface area of a cube of side x is _____.
- The surface area of a cuboid of dimensions l , b , h is _____.
- The volume of a right circular cylinder of base radius r and height h is _____.
- The radius of base of a cylinder is 7 cm and its volume is 770 cm^3 . The height of the cylinder is _____.
- Total surface area of cylinder is _____ cm^2 .
- The height of a right circular cone is 3.5 cm and its base radius is 5 cm. Its volume is _____ cm^3 .
- The formula for volume of a right circular cone is _____.
- If the base radius of a cone is 8 cm and height is 6 cm, then its slant height is _____ cm.



10. The formula for the total surface area of a right circular cone of base radius r height h and slant height l is _____.
11. The volume of a sphere of radius r is _____ and its surface area is _____.
12. The total surface area of a hemisphere of radius r is _____.

Task-5: Formulae Testing

Name of Student : _____

Task List of formulae

Class/Sec. : _____

Duration 10 minutes

Roll No. : _____

Max-Marks 10

Date : _____

Marks obtained _____

Complete the Following Table

Shape	Dimensions	C.S.A.	T.S.A	Volume
Cube	Side a units			a^3
Cuboid	length l breadth b		$2(lb + bh + lh)$	
Right Circular Cylinder	radius of base = r height = h	$2\pi rh$		$\pi r^2 h$
Right Circular Cone	radius of base = r height = h slant height l		$\pi r(l + r)$	
Sphere	radius = r	$4\pi r^2$	$4\pi r^2$	
Hemisphere (solid)	radius = r			$\frac{2}{3}\pi r^3$

