

Class – X
Lesson Plan

TOPIC: SURFACE AREA AND VOLUME

Brief description: In this lesson, learners will calculate the surface areas and the volumes of the combination of solids. They will also learn that when a solid is converted to another solid or multiple solids, either of the same or different shapes, the surface area changes but the volume remains constant. They will also learn to calculate the surface area and the volume of the frustum of a cone.

UN Sustainable Goals to be achieved (if any): Quality Education

Objectives: (According to Bloom's level)

Specific Objectives:

Students will be able to:

1. Learn the concepts of surface areas and volumes of solid shapes. (K)
2. Identify situations where there is a need of finding surface area and where there is a need of finding volume of a solid figure. (U)
3. Find the surface areas of cuboids, cubes, cylinders, cones spheres and hemispheres, using their respective formulae.(A)
4. Find the volumes of cuboids, cubes, cylinders, cones, spheres and hemispheres using their respective formulae. (A)
5. Find the surface area and volume of the combination of solids.(An)
6. Explain that when a solid is converted to another solid or multiple solids, either of the same or different shapes, the surface area changes but the volume remains constant.(Sn)
7. Define the concept of the frustum of a cone.(U)
8. Calculate the surface area and volume of a frustum of a cone. (A)
9. Solve some problems related to daily life situations involving surface areas and volumes of combination of solids.(Sn)
10. Write the proper units as per requirement of the question.(K)

Behavioral Objectives:

1. The student uses concrete models to derive formula for finding perimeter, area, surface area and volume of 2-D and 3-D shapes.
2. In engineering volume and area are very important without volume we can't figure out density or capacity
3. Student prevents themselves from being cheated like if they were able to calculate paint required, length of carpet to cover the floor, milkmen etc

Activity: Surface Areas and Volumes

1. Each student will bring an object to the class that is formed by the combination of basic solids. They need to identify the basic solids that make up the object. Then, they should take the measurements of these basic solids and calculate their surface areas and volumes. Based on these calculations, they should work out the surface areas and the volumes of the objects.

Skills :

Calculation

Reasoning

Analysis

Estimation

Expected Learning outcome

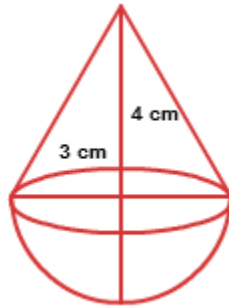
Students would be able to:

1. Learn the concepts of surface areas and volumes of solid shapes.
2. Identify situations where there is a need of finding surface area and where there is a need of finding volume of a solid figure.
3. Find the surface areas of cuboids, cubes, cylinders, cones spheres and hemispheres, using their respective formulae.
4. Find the volumes of cuboids, cubes, cylinders, cones, spheres and hemispheres using their respective formulae.
5. Find the surface area and volume of the combination of solids.
6. Explain that when a solid is converted to another solid or multiple solids, either of the same or different shapes, the surface area changes but the volume remains constant.
7. Define the concept of the frustum of a cone.
8. Calculate the surface area and volume of a frustum of a cone.
9. Solve some problems related to daily life situations involving surface areas and volumes of above solid figures.
10. Apply the proper units as per requirement of the question.
11. Use concrete models to derive formula for finding surface area and volume of 3-D shapes.
12. In engineering volume and area are very important without volume we can't figure out density or capacity

13. Prevents themselves from being cheated like if they were able to calculate paint required length of carpet to cover the floor pre hand.

Assessment: (Solo Taxonomy) (2 marks for each correct answer)

1. Find the area of triangle whose base is 10 cm and it's altitude is 7.8 cm. **(Prestructural)**
2. A cone is surmounted on a same diameter cylinder to make the shape of a tent. If the diameter of cylinder be 40 m and heights of conical and cylindrical parts are 2.1 meter and 4.2 meter. Calculate the capacity of the tent. **(Unistructural)**
3. In the figure below, a toy is shown. If the radius and height of the conical portion is 3 cm and 4 cm. find the surface area of the toy. (Use $\pi = 3.14$). **(Multistructural)**



4. Two cubes are joined end to end and have the volume 81cm^3 . Find the total surface area of the cube which is formed now. **(Relational)**
5. A drinking glass is in the shape of a frustum of a cone of height 14 cm. The diameters of its two circular ends are 4 cm and 2 cm. Find the capacity of the glass. **(Extended Abstract)**