Volume of a Cone

Objective
To get the formula for the volume of a right circular cone experimentally.

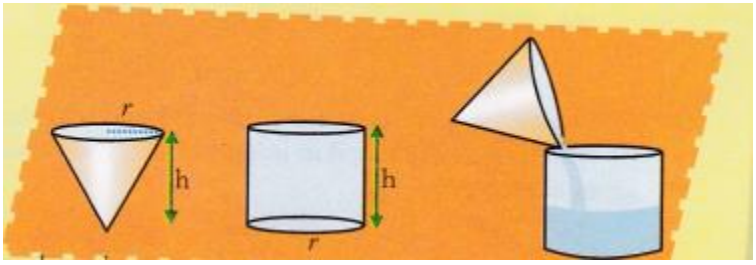
Prerequisite Knowledge

1. Formula for the volume of cylinder.
2. Concept of volume and its proportionality to the quantity of matter.

Materials Required
One cone and one cylinder having the same height and base radius, sand.

Procedure

1. Fill the cone with sand.
2. Pour the sand from the cone to the cylinder.
3. Fill the cone with sand again and pour to the cylinder.
4. Repeat the same process until the cylinder fills completely with sand.



Observation and Result
Students will observe that the cylinder gets filled after pouring the sand three times from cone.

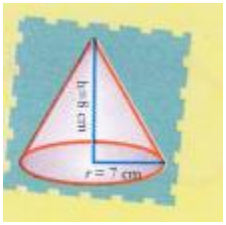
Volume of cone $=\frac{1}{3}$Volume of cylinder $=\frac{1}{3}\ \pi r^2 h$

Learning Outcome
Through this experiment, students will learn the relationship between the volume of a cone and a cylinder.

Activity Time

1. Find volume of cone.

2. What will be the volume of the cylinder having same height and radius given above ?



Viva Voce

Question 1:
Radius of a cone is halved and height is doubled. What effect will be on its volume ?
Ans. It will be half of original.
Answer:
It will be half of original

Question 2:
Radii of two cones of same heights are in the ratio 2:5. Find the ratio of their volume.
Answer:
4:25.

Question 3:
What is the volume of a cone ?
Answer:
$\frac{1}{3} \quad \pi r^2 h$

Question 4:
Can we say that volume of a cone is 3 times the volume of a cylinder ?
Answer:
No.

Question 5:
Two cones have their heights in the ratio 1 : 3 and the radii of their bases are in the ratio 3:1. What is the ratio of their volumes ?
Answer:
3:1.

Question 6:.
Base radii of two cones of same heights are in the ratio 3:5. Find the ratio of their volumes ?
Answer:
9:25.

Question 7:
What is the ratio of the volume of a cylinder to volume of a cone of same height and same base ?
Ans.
3:1.

Question 8:
Ratio of volumes of two cones having, the same base radius is 9:25, then what is the ratio of their heights ?
Answer:
9:25.

Multiple Choice Questions

Question 1:
The height of a cone is 15 cm. If its volume is 1571.4 cm^3. Then radius of the base is
(a) 10 cm
(b) 15 cm
(c) 5 cm
(d) none of these

Question 2:
Volume of the right circular cone with radius 3.5 cm, height 12 cm is
(a) 145 cm^3
(b) 154 cm^3
(c) 541 cm^3
(d) none of these

Question 3:
The volume of a largest right circular cone that can be fit in a cube whose edge is 14 cm, is
(a) 71.86 cm^3
(b) 781.6 cm^3
(c) 718.6 cm^3
(d) none of these

Question 4:
The radius and height of right circular cone are in the ratio 5 :12. If its volume is 2512 cm^3. Then slant height is
(a) 10 cm
(b) 24 cm
(c) 26 cm
(d) none of these

Question 5:
A heap of wheat is in the form of a cone whose diameter is 10.5 m and height is 3 m, then volume is
(a) 86.625 m^3
(b) 8.6625m^3
(c) 866.25 m^3
(d) none of these

Question 6:
A semi-circular thin sheet of metal of diametet 28 cm is bent to make an open conical cup. Then the capacity of the cup is
(a) 622.36 cm^3
(b) 62.236 cm^3
(c) 6223.6 cm^3
(d) none of these

Question 7:
Volume of a cone of base radius 6 cm is 264 cm'. Ther its height is
(a) 5 cm
(b) 6 cm
(c) 7 cm
(d) none of these

Question 8:
Volume of a cone of height 12 cm is 154 cm . Then the diameter of the base is
(a) 3.5 cm
(b) 7 cm
(c) 3.4 cm
(d) 7.1 cm

Question 0:
The volume of a right circular cone with radius 6 cm and height 7 cm is
(a) 246 cm
(b) 264 cm
(c) 462 cm
(d) none of these

Question 10:
The volume of a cone is 1540 cm . If the radius of its base is 10 cm, then the height of the cone is
(a) 147 cm
(b) 14.8 cm
(c) 14.7 cm
(d) 1.47 cm

Answers

1. (a)
2. (b)
3. (c)
4. (d)
5. (a)
6. (d)
7. (c)
8. (b)
9. (b)
10. (c)