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CLASS – 9

MATHEMATICS

Chapter – 11

Surface Areas and Volumes

Part – 2

Introduction

Vikas Saini

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OVERVIEW

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1. Introduction
2. Surface Area of a Right Circular Cone
3. Surface Area of a Sphere
4. Volume of a Right Circular Cone
5. Volume of a Sphere

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THREE DIMENSION SHAPES

The geometrical closed figure that occupied by three dimension space.

Example :

- Solid shapes like cuboid, cube and sphere etc.

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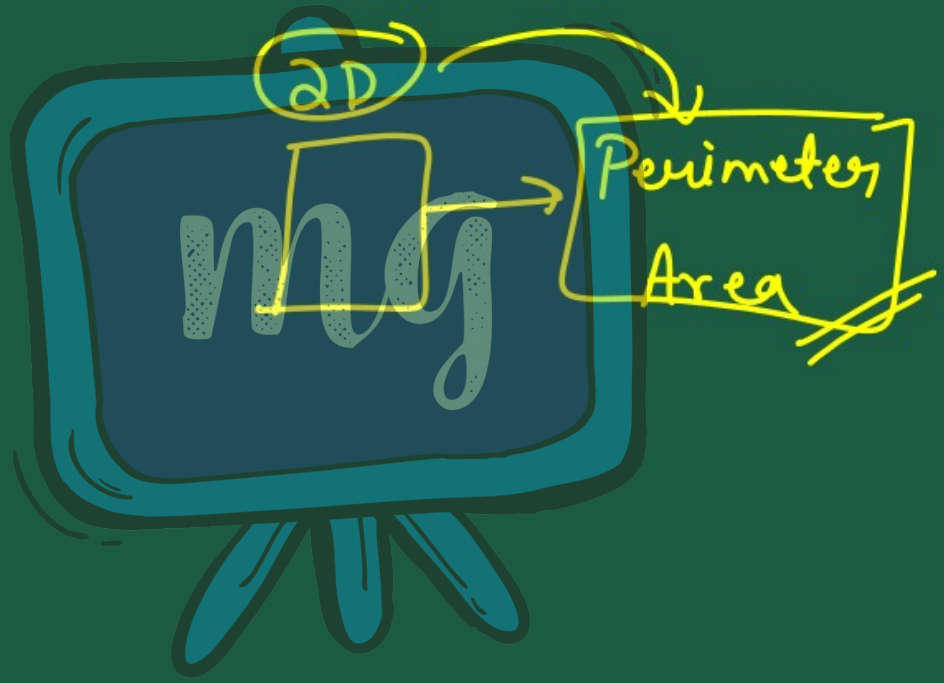

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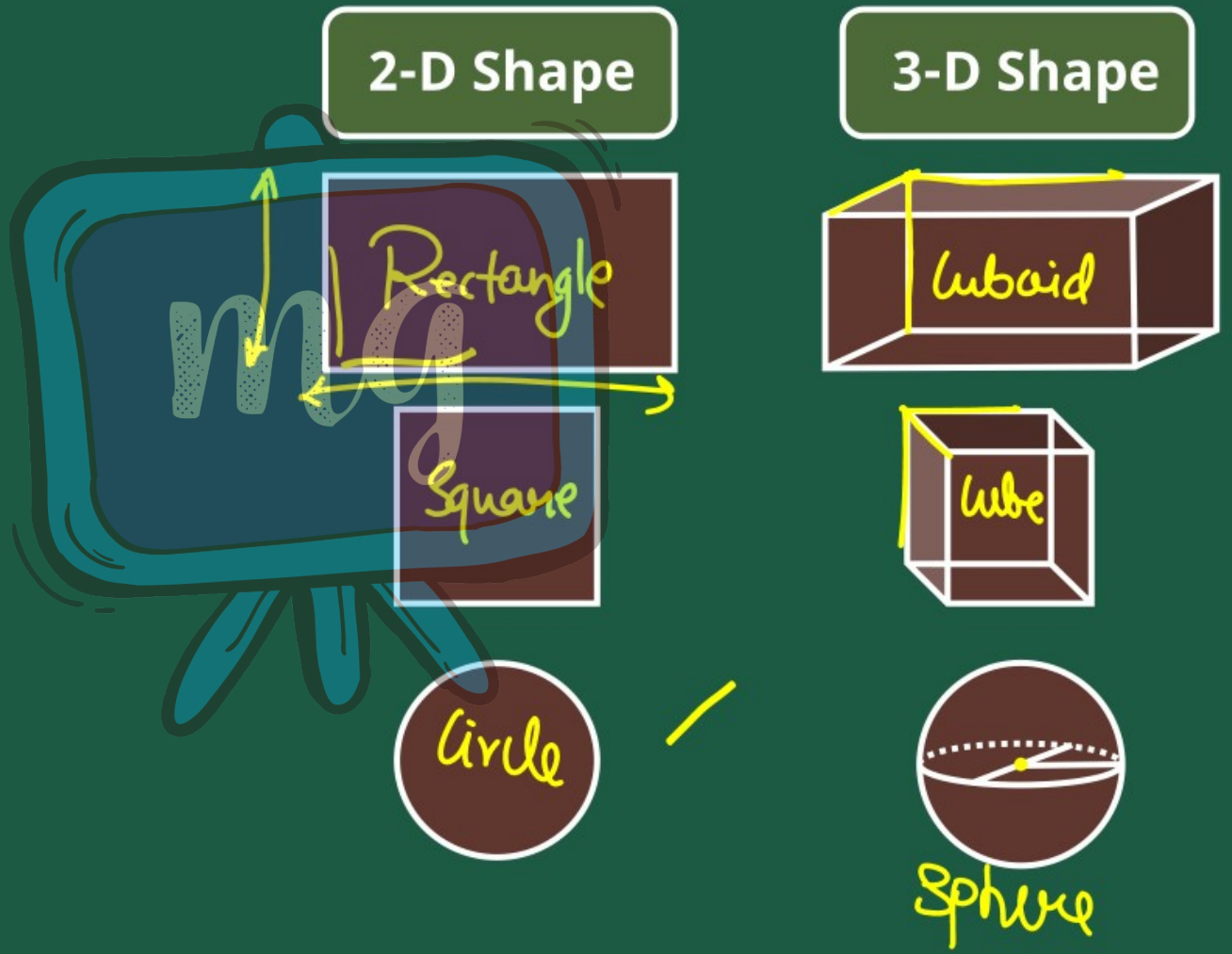

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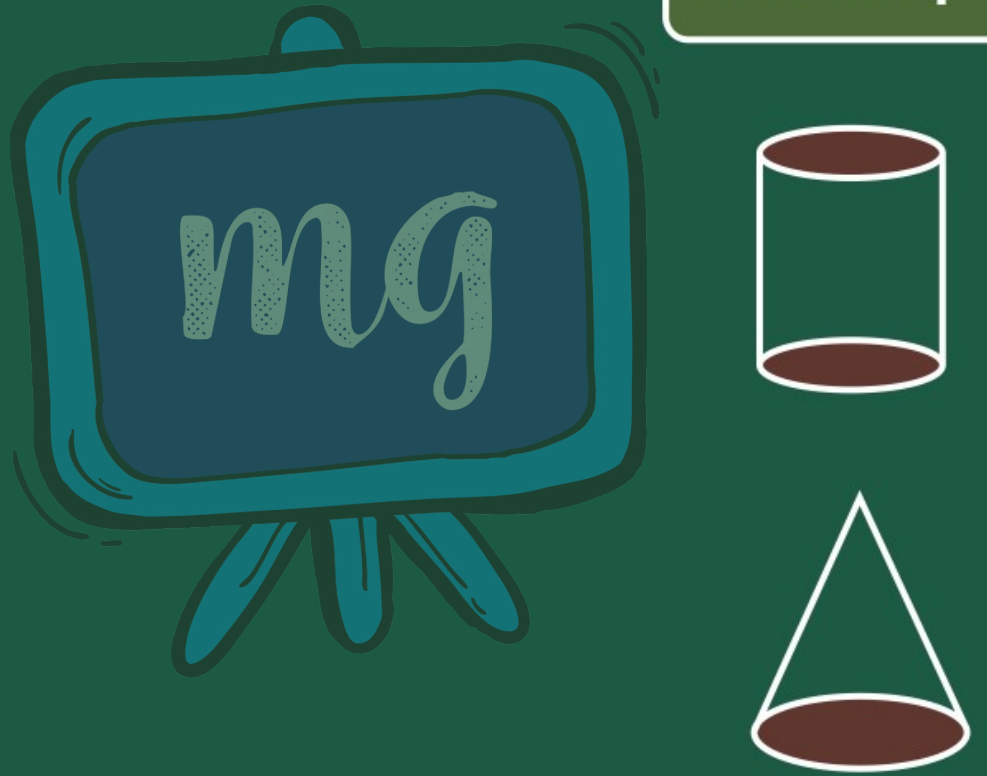
3-D Shape



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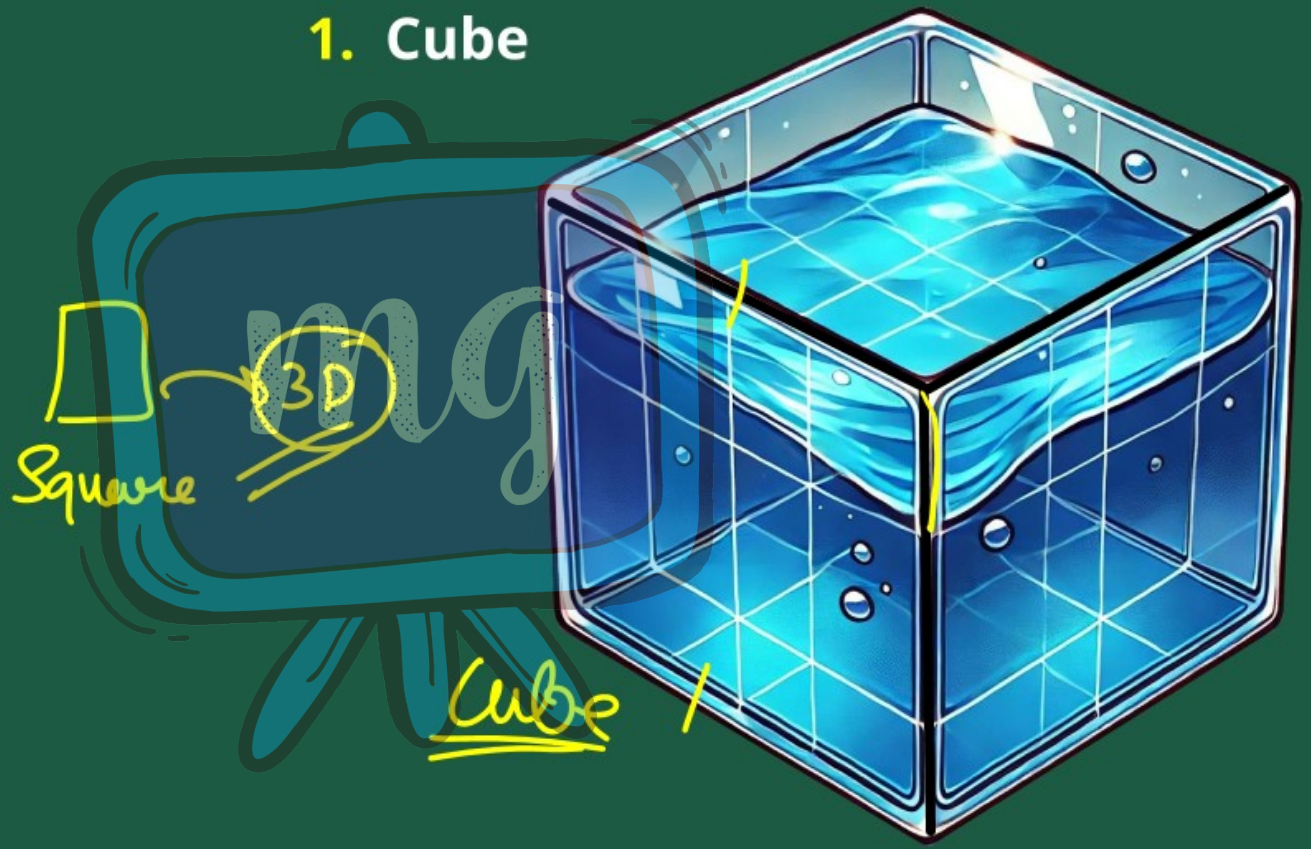
1. Cube



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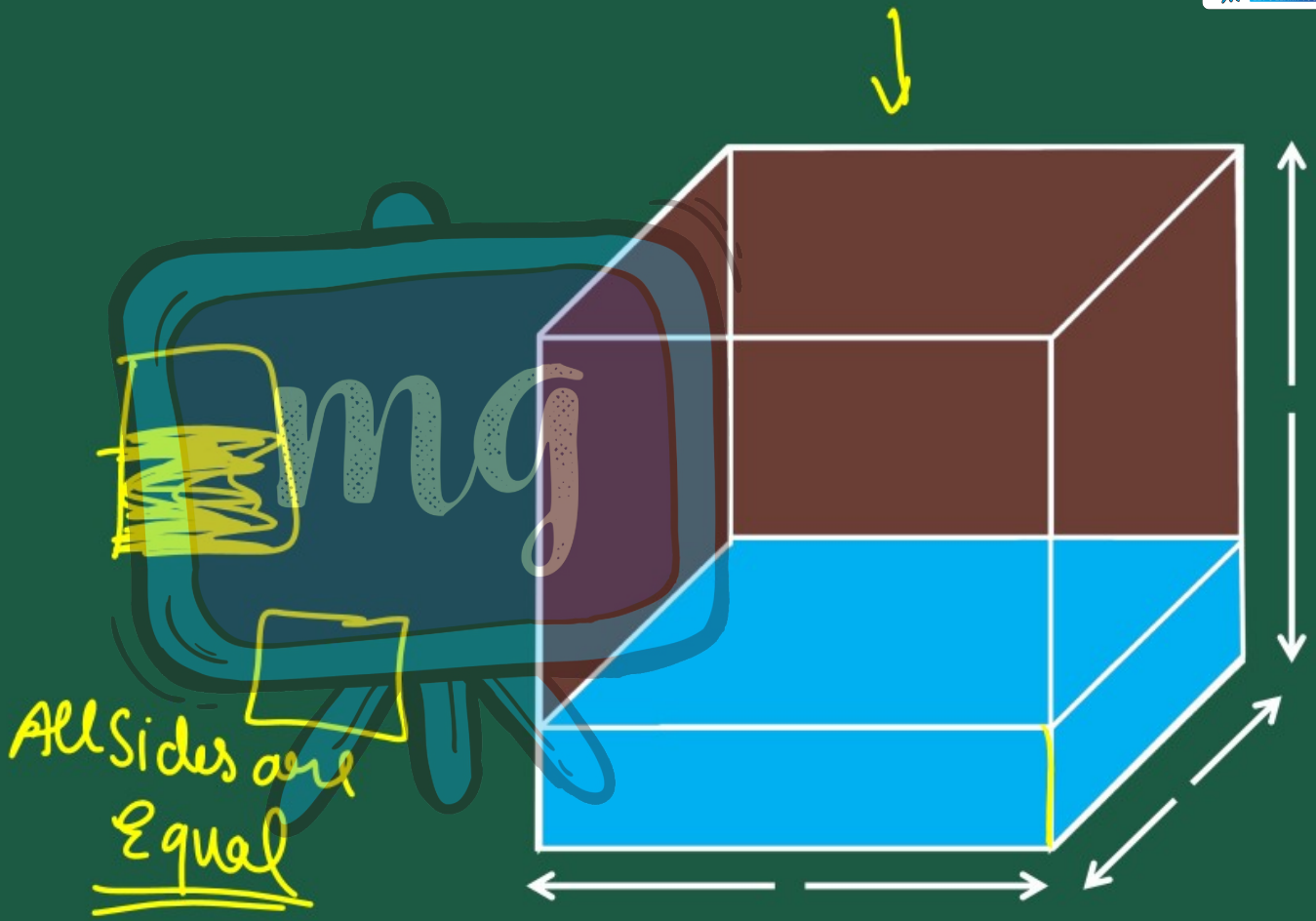

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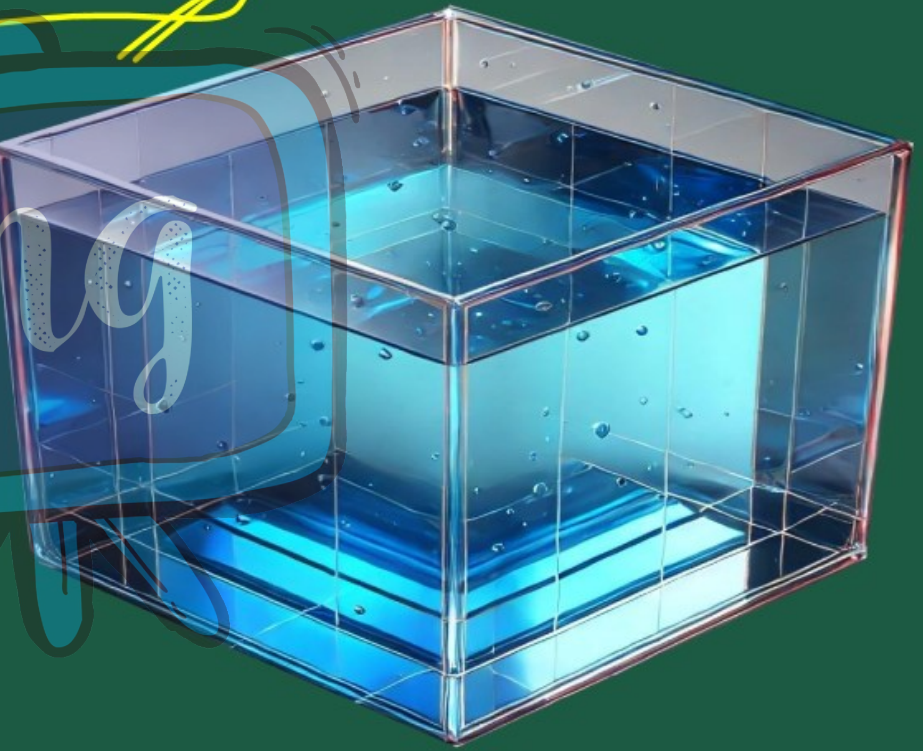
2. Cuboid



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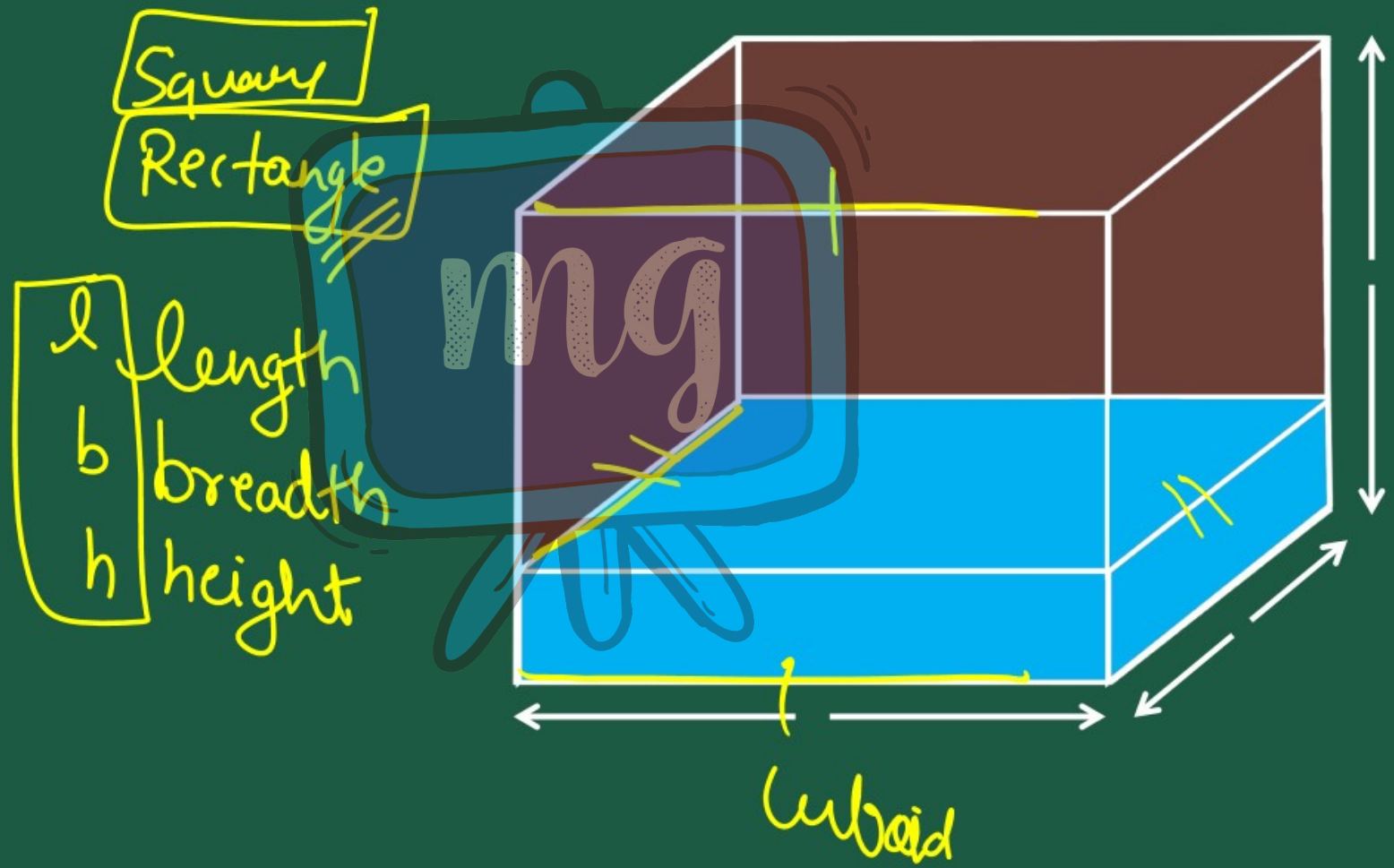

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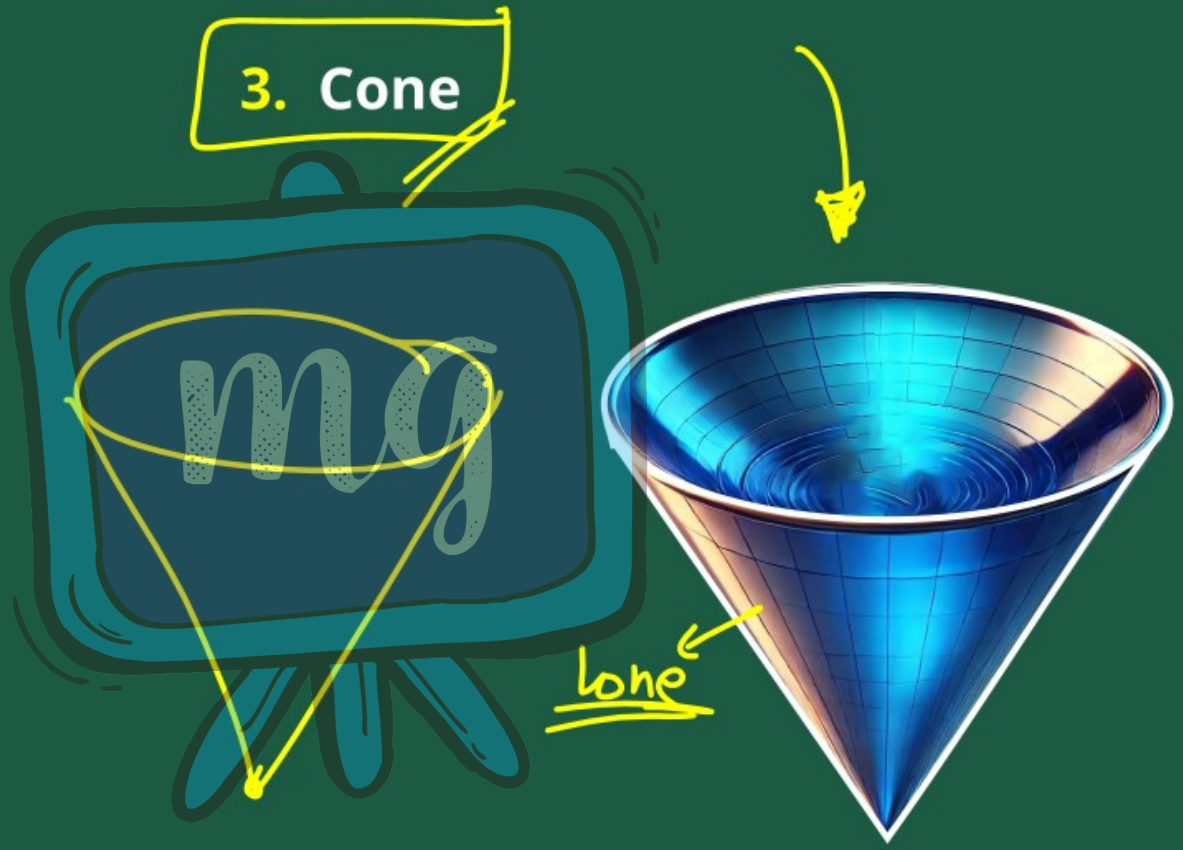

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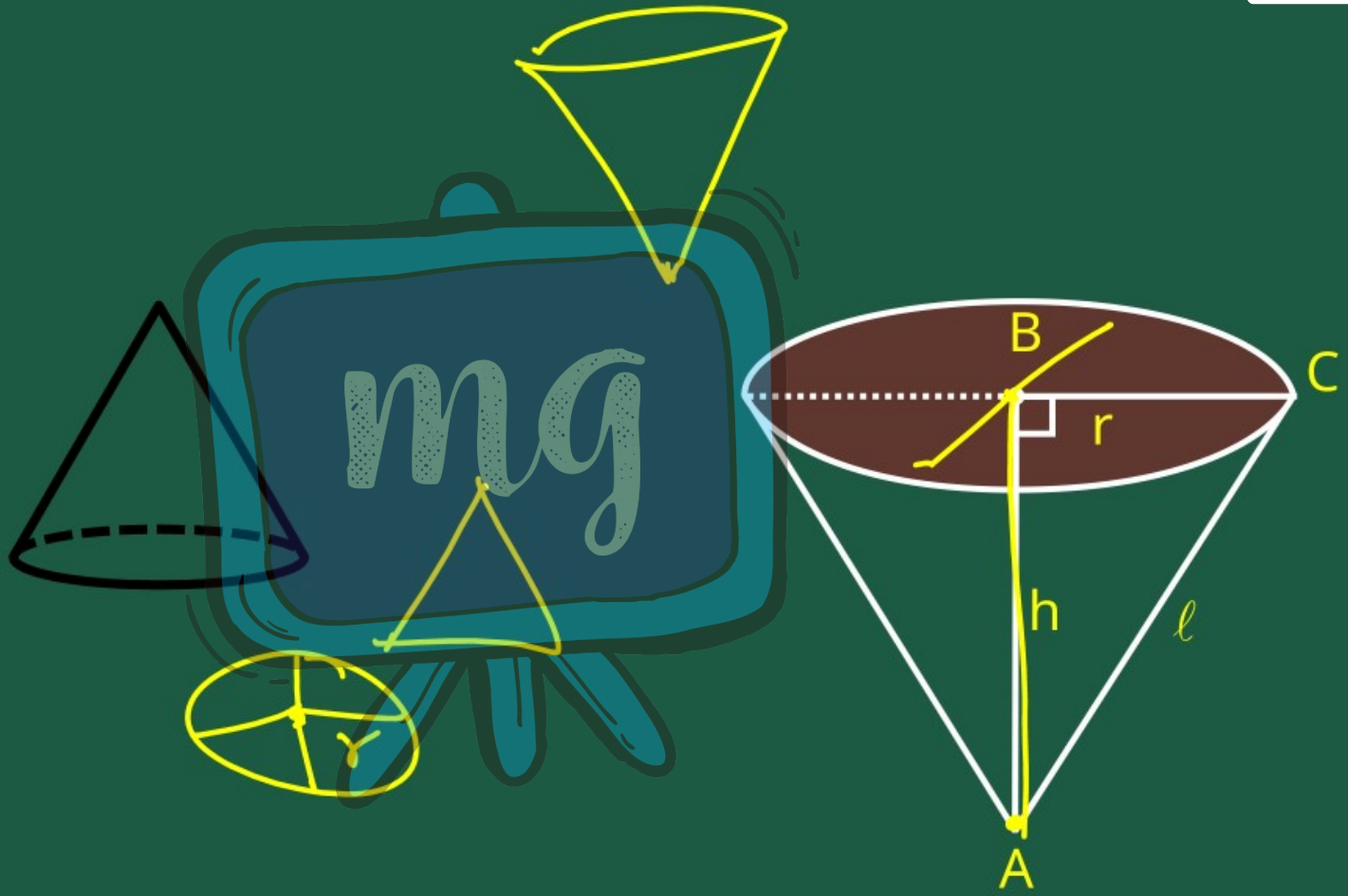

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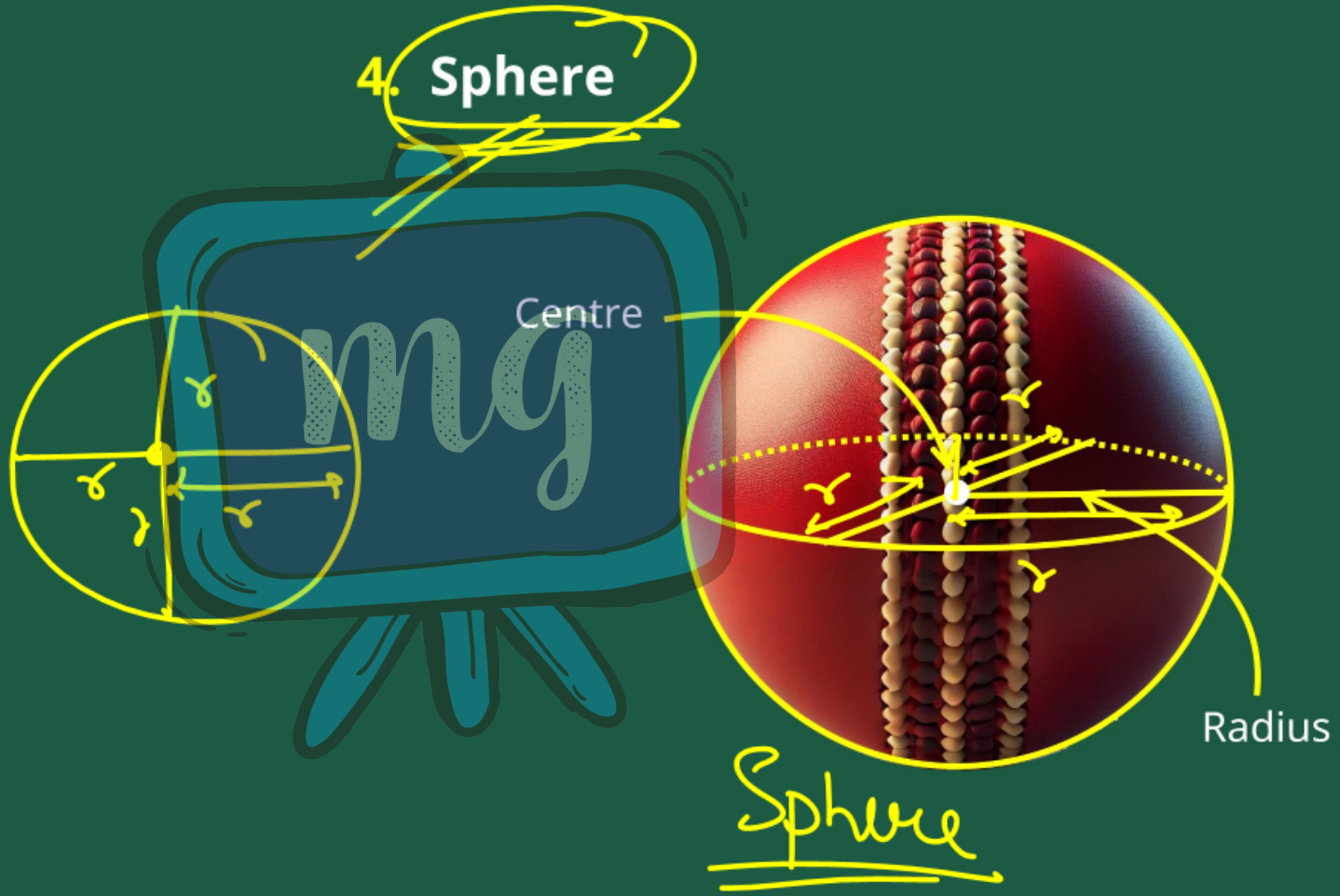
4. Sphere



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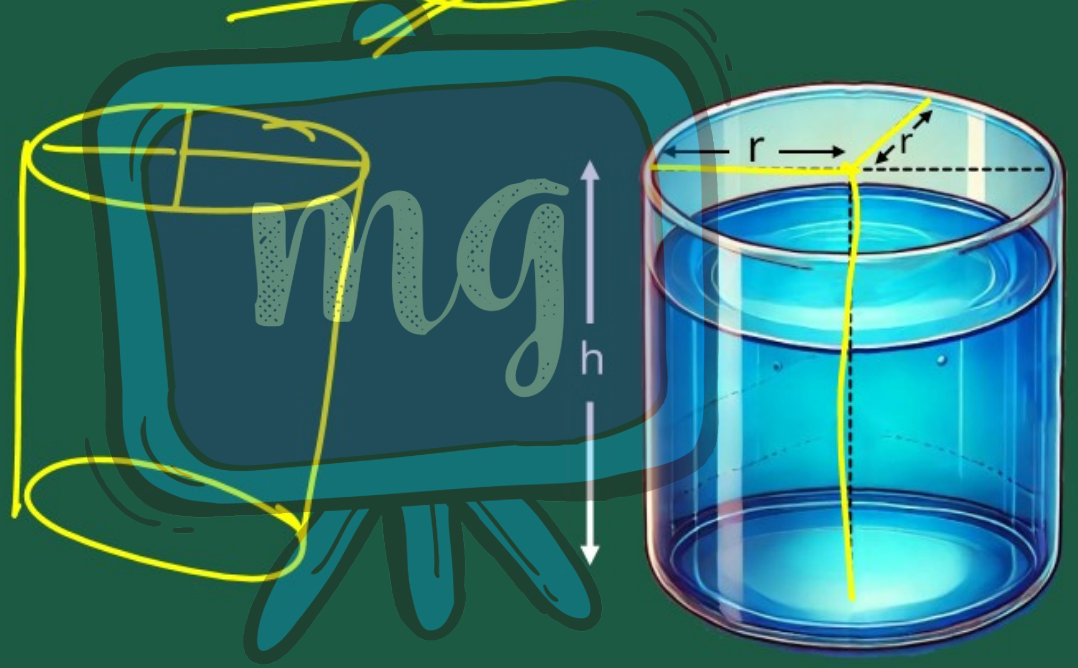
5. Cylinder



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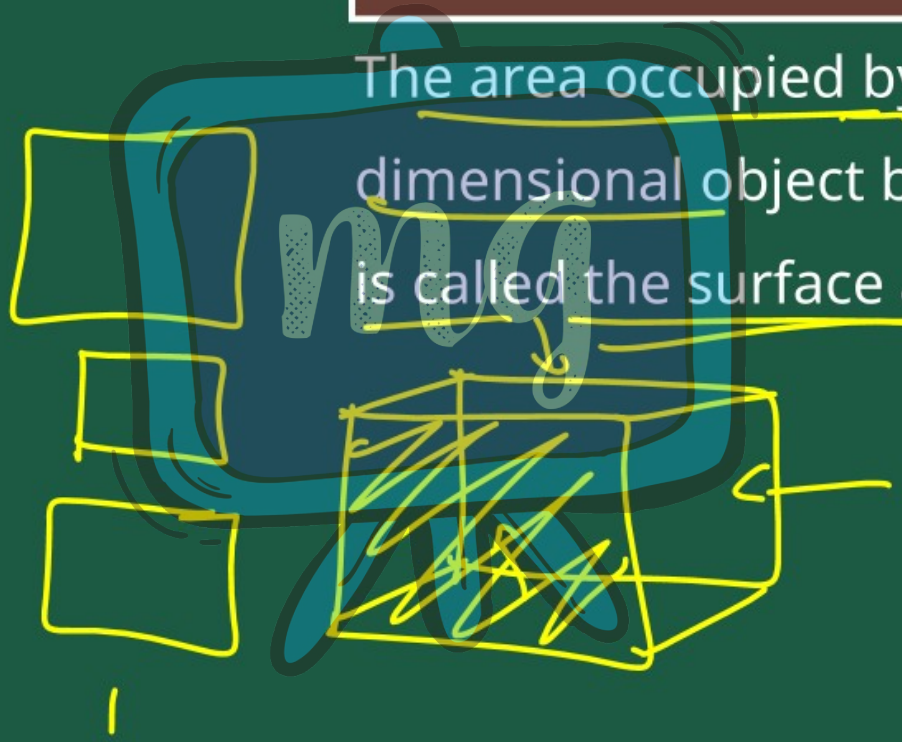
SURFACE AREA

The area occupied by a three dimensional object by its outer surface is called the surface area.



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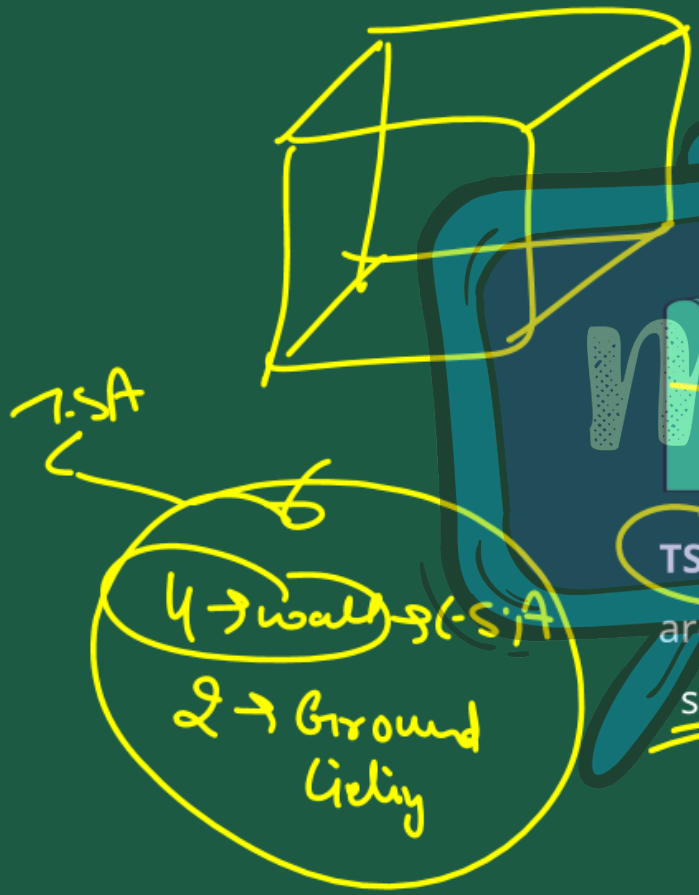

Surface Area

Total Surface Area

TSA → The sum of all areas of a 3d shape's surfaces, including bases.

Curved/Lateral Surface Area

CSA / LSA → The sum of all areas of a 3d shape's surfaces, excluding bases.

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$2 \times b \times h$

$2 \times l \times b$

$2 \times l \times h$

$2 \times lh + 2bh$

l

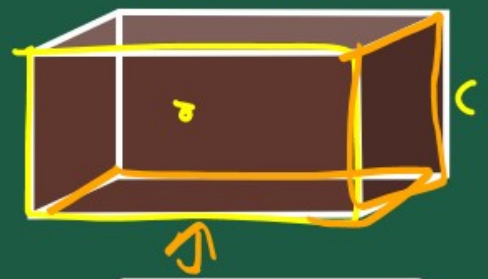
b

h

One dimes → 2 Surfs



Cuboid



Total Surface area of cuboid	→	2(lb+bh+hl)
Curved Surface area of cuboid	→	2(l + b) × h

$2 \times lb + 2 \times bh + 2lh$

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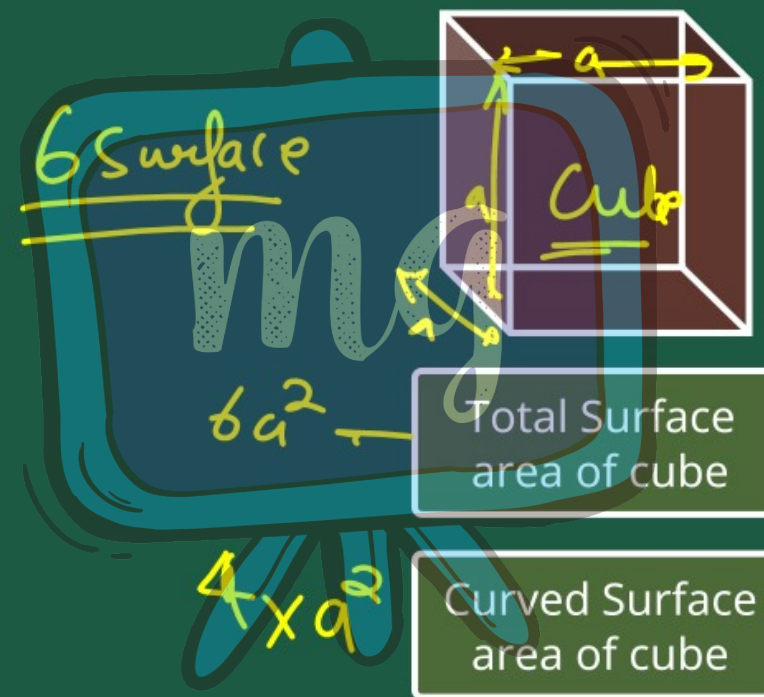
$a \times a = a^2$





Total Surface area of cube	$6 \times a^2$
Curved Surface area of cube	$4 \times a^2$

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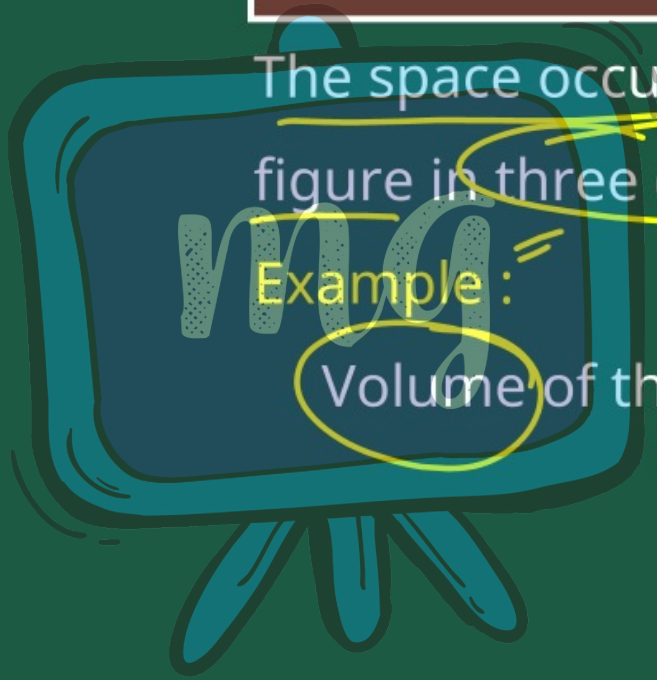
THREE DIMENSION SPACE



The space occupied by any geometrical figure in three dimensions.

Example :

Volume of the capacity any 3D figure.

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VOLUME



- The amount of liquid that can be filled in any object/solid is called the volume of that solid.
- Volume is also called the 'capacity' of the solid.
- Units of measurement of volume are cubic cm (cm^3), cubic meter (m^3), cubic liter (l^3), cubic ml (ml^3) etc.

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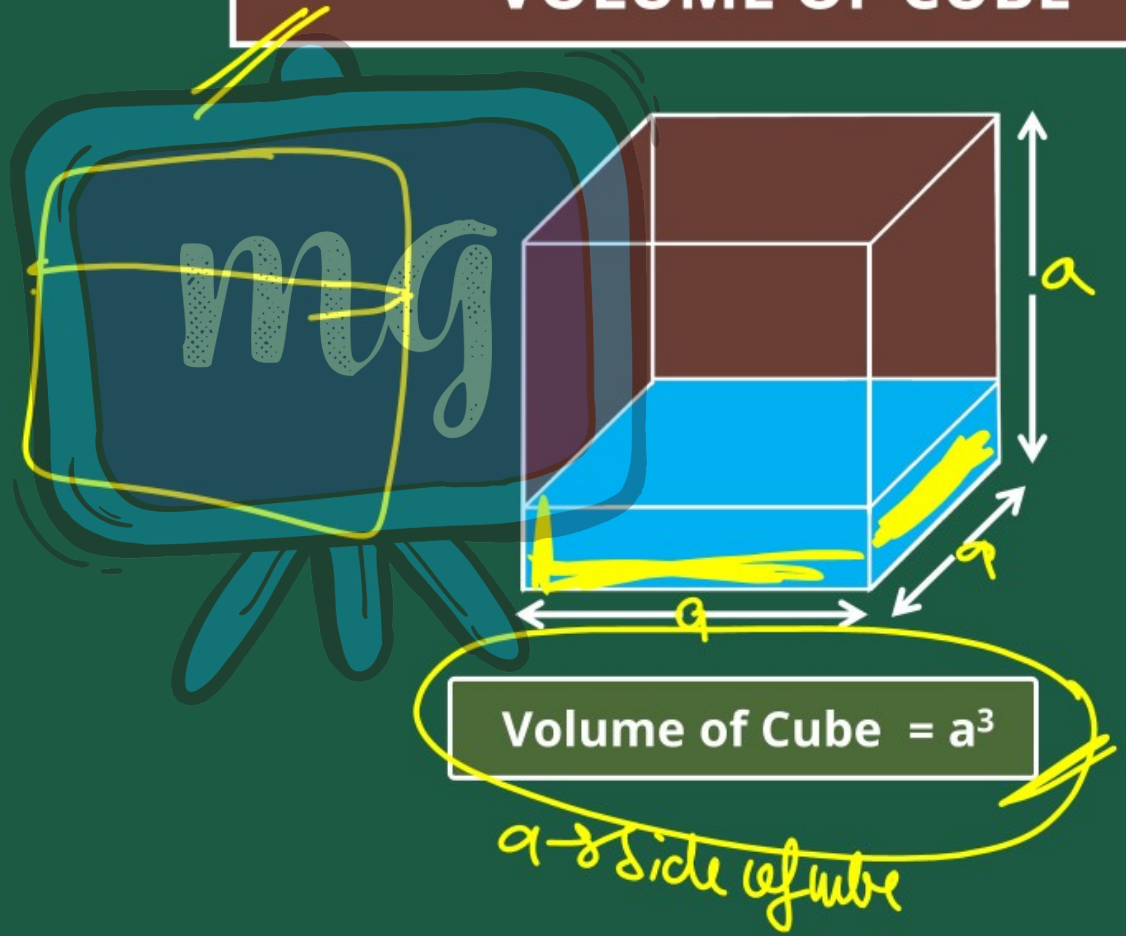
VOLUME OF CUBE



Volume of Cube = a^3

a → Side of cube

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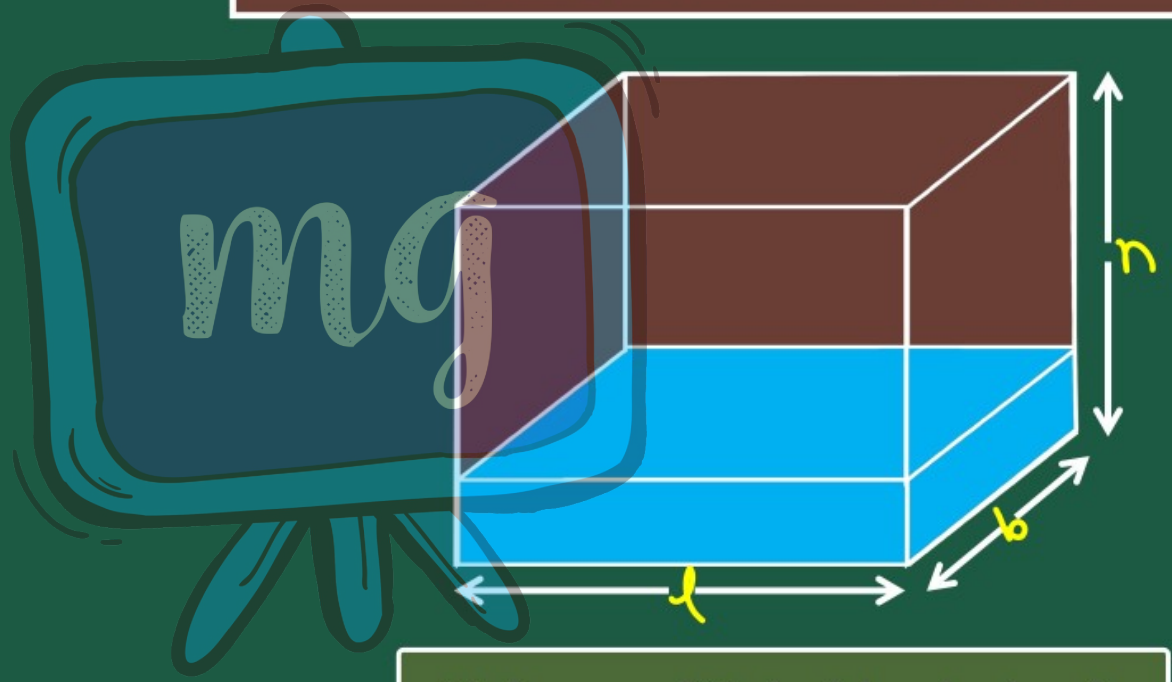
VOLUME OF CUBOID



Volume of Cuboid = l × b × h

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LEARNING OUTCOME

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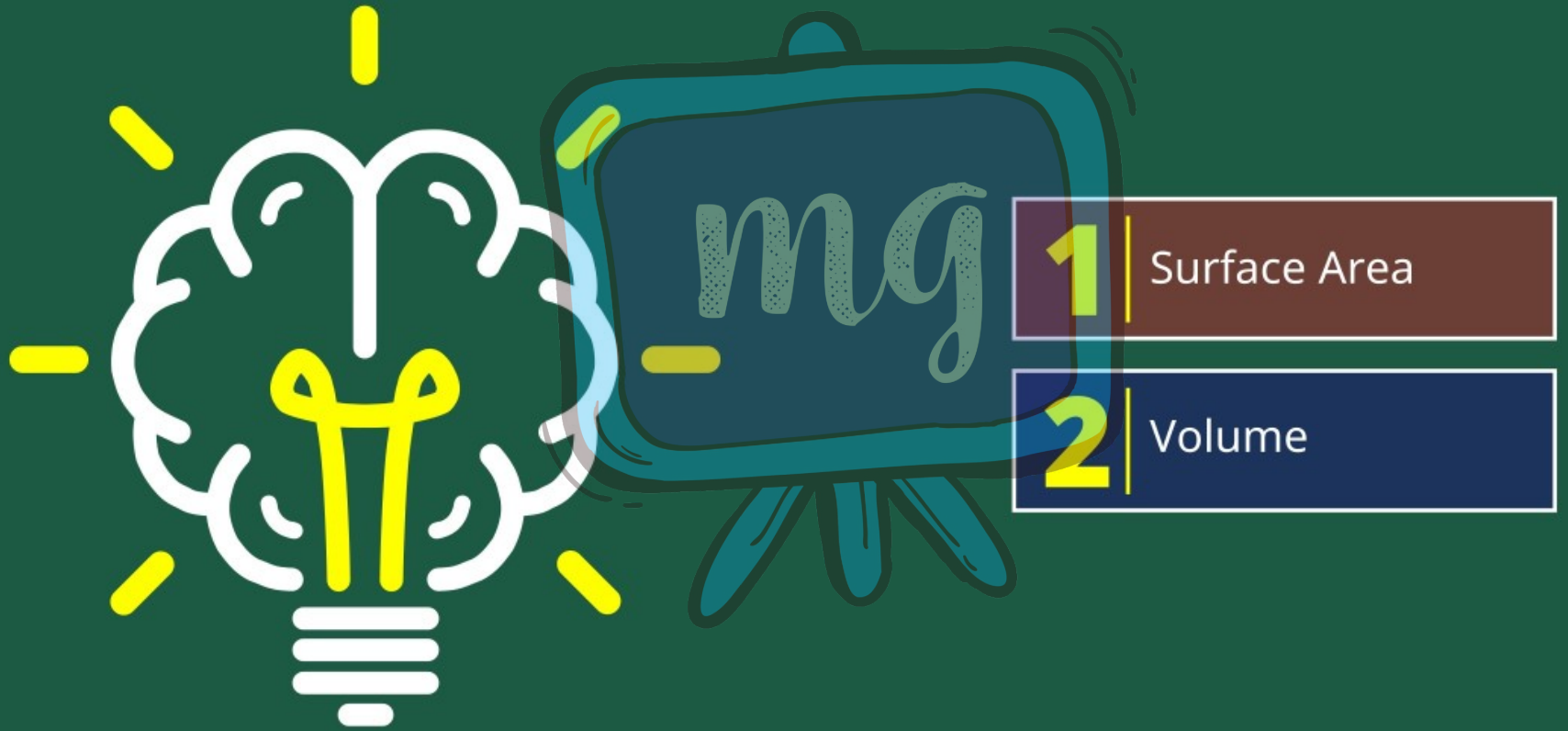

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ASSESSMENT

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1 The surface area of cube whose edge equals to 3cm is

A 62 sq.cm.

B 30 sq.cm.

C 54 sq.cm.

D 90 sq.cm.

Surface area

$a = 3\ cm$

$T.S.A = 6 \times a^2$

$= 6 \times (3)^2 = 6 \times 9$

$= 54\ cm^2$



2 A cube has a volume of 512 cm^3. What is length of its side?

A 4 cm

B 6 cm

C 8 cm

D 10 cm

Vol. of cube $= 512\ cm^2$

Vol. of cube $= a^3$

$a^3 = 512$

$a = \sqrt[3]{512} = 8\ cm$



3 Find the height of a cuboid whose volume is 275 cm^3 and base area is 25 cm^2.

A 26 cm

B 11 cm

C 27 cm

D 25 cm

Vol. of cuboid = 275 cm^3

base area = 25 cm^2

$l \times b = 25\ cm^2$

Vol. of cuboid = $l \times b \times h = 275$

$25 \times h = 275$

$h = \frac{275}{25} = 11$ cm