GEOMETRY: 3-DIMENSIONAL SOLIDS

COMMON MISTAKES
Geometry-3 Dimensional Solids

Defining Solids and Measuring their Ins and Outs

- **Definition** - 3 Dimensional Solids consist of length, width, and height components. The solids have at least one, if not 2 that are parallel, bases and some type of “sides”.

- **LATERAL AREA** (LA) is the sum of the areas of the sides only.

- **SURFACE AREA** (SA) is the sum of the LA, area of the sides, and the area of the Base(s). It is the TOTAL AREA.

- **VOLUME** (V) measures how much a solid “holds”. Using thin “slices” of the Base Area of the solid, we stack them various heights; and the result is the **Volume of a Prism** (a solid with parallel bases and rectangles for sides).

- **VOLUME** = Base Area x height of the prism
  
or, as commonly written, V=Bh

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Common Mistakes

- Forgetting to use the AREA of the BASE in the calculation of volume.

  Incorrect:
  
  Volume = (2 x 12 + 2 x 8) x 4
  
  = 160 square meters

  

  Correct:
  
  Volume = (12 x 8) x 4
  
  = (96 sq m) x 4 m
  
  = 384 cubic meters
Geometry-3 Dimensional Solids continued

Dimensions used in the Measurement of Solids

- **Lateral Area (LA) and Surface Area (SA)** - because they specifically involve area, they are 2-Dimensional. The units of SA and LA are considered to be units of area or square units (i.e. sq cm, sq ft, etc. since....

  - **length • width**
  - or
  - **cm • cm** becomes **cm²**.

Common Mistakes

- Not counting the Area of the Base twice when computing the SA of Prisms

  **Incorrect:**
  
  \[ \text{SA} = \text{Sum of the Areas of the Top, Front, Back, Left, and Right Sides} \]

  **Correct:**
  
  \[ \text{SA} = \text{Sum of the Areas of the Top and Bottom; Front and Back; Left and Right Sides} \]