Learning outcomes
At the end of this chapter, Learners will:
- Find the total surface area of cylinder and triangular prism
- Calculate the volume of cylinder and triangular prism
- Describe density
- Calculate density of regular objects

CONCISE INFORMATION

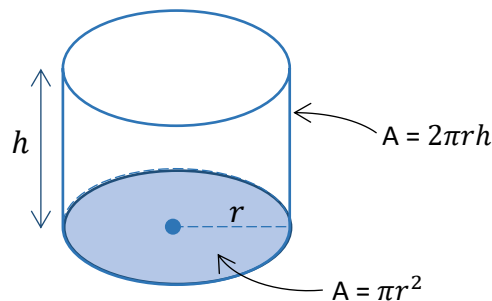### Total Surface Area of Cylinder and Triangular prism
The Total Surface Area (T.S.A) of a cylinder is given by:
(a) *Open Cylinder*
The total surface area of a open cylinder is the sum of a circle and the curved surface.

T.S.A $= \pi r^2 + 2\pi rh$ for an open cylinder
T.S.A $= \pi r(r + 2h)$
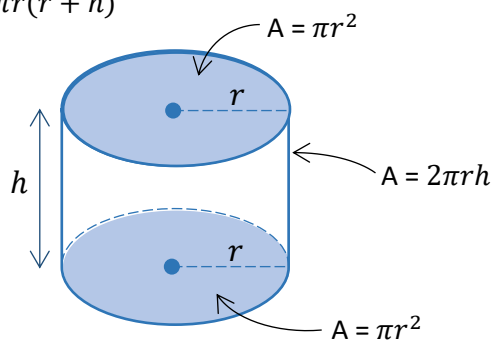

(b) *Closed Cylinder*
The total surface area of a closed cylinder is the sum of the two congruent circles and the curved surface.

T.S.A $= \pi r^2 + \pi r^2 + 2\pi rh$ for an closed cylinder
T.S.A $= 2\pi r^2 + 2\pi rh$
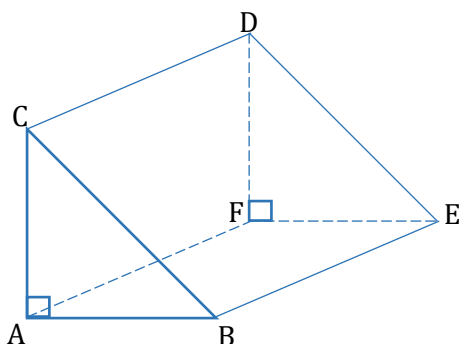T.S.A $= 2\pi r(r + h)$

(c) *Triangular prism*
The total surface area is the sum of the two congruent triangles and the three rectangles.

Note:
The two congruent triangles are △ABC and △FED.

The three rectangles are ACDF, BCDE and ABEF.

T.S.A = Area of two congruent triangles + Area of three rectangles
$$= 2\left(\frac{1}{2} \times AB \times BC\right) + \text{Area of } ACDF + \text{Area of BCDE} + \text{Area of } ABEF$$
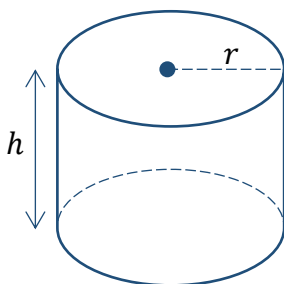
Volume of Cylinder and Triangular Prism

(a) *Cylinder*

The volume of a cylinder is given by:

Volume = *Base Area × Perpendicular Height*

Or

Volume = *Cross sectional Area × Perpendicular Height*

Volume $= \pi r^2 h$

(b) *Triangular Prism*
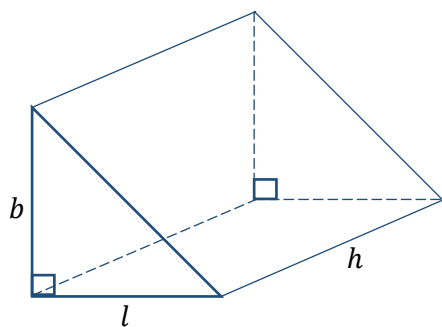
The volume of a triangular prism is given by:

Volume = *Base Area × Perpendicular Height*

Or

Volume = *Cross sectional Area × Perpendicular Height*

Volume $= \frac{1}{2} \times l \times b \times h$

Note:

The cross sectional (base) area in a triangular prism is covered by a triangle.

where,

l is the length of the triangle

b is the breadth of the triangle

h is the perpendicular height of the prism

Density of regular objects

The density of an object or a solid is the ratio of its mass to the volume. It is the amount mass per unit volume. Thus density is given by:

$$Density = \frac{Mass}{Volume}$$

Alternatively,

$$Mass = Density \times Volume$$

Or

$$Volume = \frac{Mass}{Density}$$