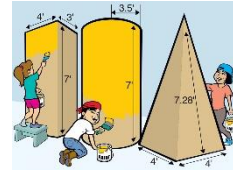


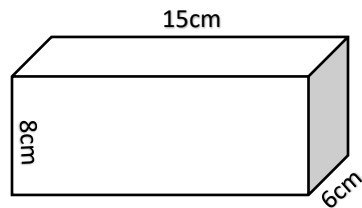


Grade 8 - Mathematics Surface Area and Volume 1



Memo

1. Calculate surface area of the following rectangular prism.



$$\begin{aligned} SA &= 2(lh + lb + bh) \\ &= 2[(15\text{cm} \times 8\text{cm}) + (15\text{cm} \times 6\text{cm}) + (6\text{cm} \times 8\text{cm})] \\ &= 2[120\text{cm}^2 + 90\text{cm}^2 + 48\text{cm}^2] \\ &= 2 \times 258\text{cm}^2 \\ &= 516\text{cm}^2 \end{aligned}$$

2. Calculate the surface area of a rectangular prism with a length of 12m, a breadth of 2,5m and a height of 3,5m.

$$\begin{aligned} SA &= 2(lh + lb + bh) \\ &= 2[(12\text{m} \times 3,5\text{m}) + (12\text{m} \times 2,5\text{m}) + (2,5\text{m} \times 3,5\text{m})] \\ &= 2[42\text{m}^2 + 30\text{m}^2 + 8,75\text{m}^2] \\ &= 2 \times 80,75\text{m}^2 \\ &= 161,5\text{m}^2 \end{aligned}$$

3. Calculate the surface area of a cube with sides of 95mm.

$$\begin{aligned} SA &= 6(s \times s) \\ &= 6(95\text{mm} \times 95\text{mm}) \\ &= 6(9\,025\text{mm}^2) \\ &= 54\,150\text{mm}^2 \end{aligned}$$



WorksheetCloud

4. Calculate the surface area of a rectangular prism with a length of 6cm, a breadth of 25mm and a height of 92mm.

Change all measurements to the same units:

$$6\text{cm} = 60\text{mm}$$

$$SA = 2(lh + lb + bh)$$

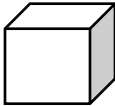
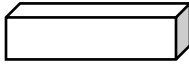
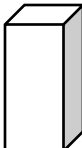
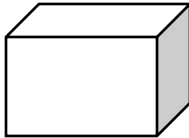
$$= 2[(60\text{mm} \times 92\text{mm}) + (60\text{mm} \times 25\text{mm}) + (25\text{mm} \times 92\text{mm})]$$

$$= 2[5\,520\text{mm}^2 + 1\,500\text{mm}^2 + 2\,300\text{mm}^2]$$

$$= 2 \times 9\,320\text{mm}^2$$

$$= 18\,640\text{mm}^2$$

5. Calculate the missing dimensions for each of the prisms below, to two decimal places:

Prism	Base dimensions	Height	Surface Area
1. 	$S = 7,25\text{mm}$		$315,8\text{mm}^2$
2. 	$l = 5\text{m}$ $b = 4\text{m}$	$h = 3\text{m}$	$SA = 94\text{m}^2$
3. 	$l = 10\text{cm}$ $b = 5\text{cm}$	$h = 25\text{cm}$	$SA = 850\text{cm}^2$
4. 	$l = 25\text{mm}$ $b = 15\text{mm}$	$h = 14\text{mm}$	$SA = 1\,870\text{mm}^2$



Working:

- $SA = 6(s \times s)$
 $= 6(7,25\text{mm} \times 7,25\text{mm})$
 $= 6 \times 52,5625\text{mm}^2$
 $= 315,38\text{mm}^2$
- $SA = 2(lh + lb + bh)$
 $94\text{m}^2 = 2[(5\text{m} \times h) + (5\text{m} \times 4\text{m}) + (4\text{m} \times h)]$
 $94\text{m}^2 = 2[(5\text{hm}^2 + 20\text{m}^2 + 4\text{hm}^2)]$
 $94\text{m}^2 \div 2 = 5\text{hm} + 20\text{m}^2 + 4\text{hm}$
 $47\text{m}^2 = 9\text{hm} + 20\text{m}^2$
 $47\text{m}^2 - 20\text{m}^2 = 9\text{hm}$
 $27\text{m}^2 = 9\text{hm}$
 $27\text{m}^2 \div 9\text{m} = h$
 $3\text{m} = h$
- $SA = 2(lh + lb + bh)$
 $850\text{cm}^2 = 2[(10\text{cm} \times 25\text{cm}) + (10\text{cm} \times b) + (b \times 25\text{cm})]$
 $850\text{cm}^2 = 2[250\text{cm}^2 + 10\text{bcm} + 25\text{bcm}]$
 $850\text{cm}^2 \div 2 = 250\text{cm}^2 + 35\text{bcm}$
 $425\text{cm}^2 = 250\text{cm}^2 + 35\text{bcm}$
 $425\text{cm}^2 - 250\text{cm}^2 = 35\text{bcm}$
 $175\text{cm}^2 = 35\text{bcm}$
 $175\text{cm}^2 \div 35\text{cm} = b$
 $5\text{cm} = b$
- $SA = 2(lh + lb + bh)$
 $1\,870\text{mm}^2 = 2[(l \times 14\text{mm}) + (l \times 15\text{mm}) + (15\text{mm} \times 14\text{mm})]$
 $1\,870\text{mm}^2 = 2[14l\text{mm} + 15l\text{mm} + 210\text{mm}^2]$
 $1\,870\text{mm}^2 \div 2 = 29l\text{mm} + 210\text{mm}^2$
 $935\text{mm}^2 = 29l\text{mm} + 210\text{mm}^2$
 $935\text{mm}^2 - 210\text{mm}^2 = 29l\text{mm}$
 $725\text{mm}^2 = 29l\text{mm}$
 $725\text{mm}^2 \div 29\text{mm} = l$
 $25\text{mm} = l$