

# Mid-Chapter Review

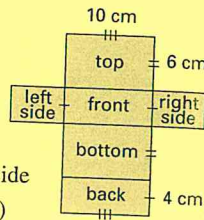
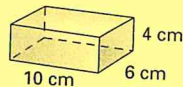
## Frequently Asked Questions

**Q:** How do you calculate the surface area of a rectangular prism?

**A1:** Add the areas of all the object's faces.

For the prism shown,

$$\begin{aligned} \text{Surface Area} &= \text{Area of top} + \text{Area of bottom} + \text{Area of front} \\ &\quad + \text{Area of back} + \text{Area of left side} + \text{Area of right side} \\ &= (10 \text{ cm} \times 6 \text{ cm}) + (10 \text{ cm} \times 6 \text{ cm}) + (10 \text{ cm} \times 4 \text{ cm}) \\ &\quad + (10 \text{ cm} \times 4 \text{ cm}) + (4 \text{ cm} \times 6 \text{ cm}) + (4 \text{ cm} \times 6 \text{ cm}) \\ &= 60 \text{ cm}^2 + 60 \text{ cm}^2 + 40 \text{ cm}^2 + 40 \text{ cm}^2 + 24 \text{ cm}^2 + 24 \text{ cm}^2 \\ &= 248 \text{ cm}^2 \end{aligned}$$



**A2:** Notice that the front and the back are congruent, the left side and the right side are congruent, and the top and the bottom are congruent. Calculate the areas of the front or back, left side or right side, and top or bottom. Double each area, and then add.

$$\begin{aligned} \text{Surface Area} &= (2 \times 60 \text{ cm}^2) + (2 \times 40 \text{ cm}^2) + (2 \times 24 \text{ cm}^2) \\ &= 120 \text{ cm}^2 + 80 \text{ cm}^2 + 48 \text{ cm}^2 \\ &= 248 \text{ cm}^2 \end{aligned}$$

**A3:** Calculate the areas of the front or back, left side or right side, and top or bottom. Add the three areas, and then double.

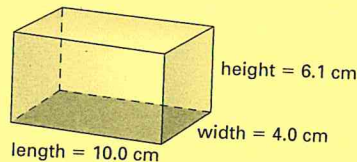
$$\begin{aligned} \text{Surface Area} &= 2 \times (60 \text{ cm}^2 + 40 \text{ cm}^2 + 24 \text{ cm}^2) \\ &= 2 \times 124 \text{ cm}^2 \\ &= 248 \text{ cm}^2 \end{aligned}$$

**Q:** How do you calculate the volume of a rectangular prism?

**A:** Choose one face to use as the base. For the prism shown, the darker blue face is a good choice because the dimensions are whole numbers and are easier to multiply.

Multiply the length by the width to calculate the area of the base. Multiply the area of the base by the height to calculate the volume of the prism.

$$\begin{aligned} \text{Volume} &= \text{Area of base} \times \text{height} \\ &= (10.0 \text{ cm} \times 4.0 \text{ cm}) \times 6.1 \text{ cm} \\ &= 244.0 \text{ cm}^3 \end{aligned}$$



## Practice Questions

- (11.1) 1. Calculate the surface area of each item. Sketch the item, and label its dimensions.

Item	Length	Width	Height
a) tissue box	22 cm	7 cm	10 cm
b) cereal box	16.3 cm	5.0 cm	27.5 cm
c) candy box	17.5 cm	2.5 cm	6.5 cm
d) CD case	140 mm	10 mm	125 mm

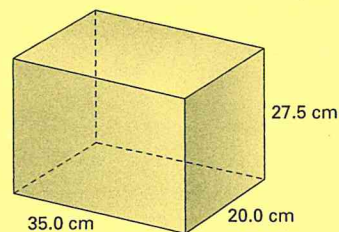
- (11.1) 2. Meagan needs to paint the outside of a box for an art project. The box is 18 cm by 5 cm by 2 cm. What surface area does she need to paint?

- (11.1) 3. Explain how you would determine the surface area of an open-top rectangular box. Draw a net to support your explanation.

- (11.1) 4. A cube is cut in half. Explain why the total surface area of the two halves is more than the surface area of the original cube.

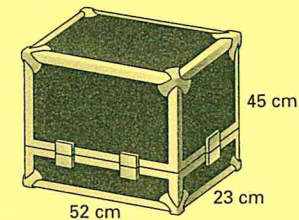
- (11.1) 5. Can you use the same number of linking cubes to create rectangular prisms with different surface areas? Sketch some prisms made from 16 cubes to support your answer.

- (11.2) 6. Calculate the volume of this aquarium.

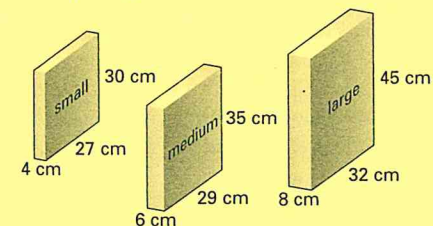


7. Calculate the volume of each item. (11.2)

- a printer cartridge box  
13.5 cm by 3.5 cm by 11.5 cm
- a magazine box  
24.0 cm by 10.0 cm by 30.5 cm
- a guitar amplifier road case



8. Mercury Courier charges \$0.10/cm<sup>3</sup> to deliver a package. How much will the courier service charge to deliver each of these packages? (11.2)



9. What is the capacity of the aquarium in question 6? (*Hint:* 1 cm<sup>3</sup> = 1 mL) (11.2)

10. a) Which rectangular prism has a greater volume?

- b) Which rectangular prism has a greater surface area? (11.2)

