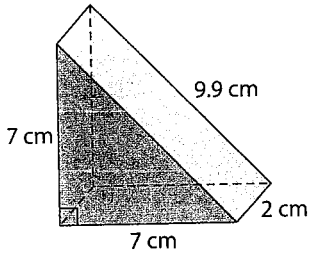
Show You Know

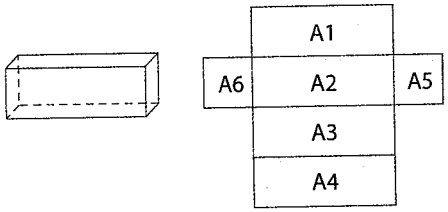
Use two methods to find the surface area of this triangular prism.
Hint: A triangle is half the area of a rectangle.



Connect and Reflect

Key Ideas

- Surface area is the sum of the areas of all the faces of a 3-D object.

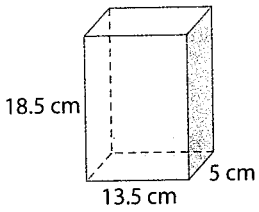


Surface Area = A1 + A2 + A3 + A4 + A5 + A6,
where A1 represents the area of rectangle 1, A2 represents the area of rectangle 2, and so on.

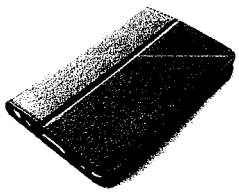
Practise

For help with #1 and #2, refer to Example 1 on pages 51–52.

1. Find the surface area of this right rectangular prism to the nearest tenth of a square centimetre.

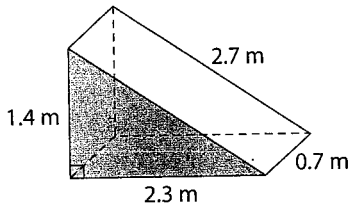


2. Find the surface area of this personal tablet case. Its dimensions are 17.0 cm × 12.5 cm × 1.3 cm.



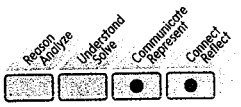
For help with #3, refer to Example 2 on page 53.

3. Calculate the surface area of this ramp in the shape of a right triangular prism. Give your answer to the nearest tenth of a square metre.

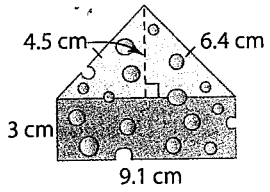


Apply

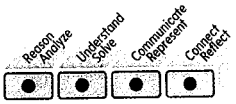
4. Write a set of directions that you could use to determine the surface area of a prism. Share your directions with a classmate.



5. Cheese is sometimes packaged in a triangular box. How much cardboard would you need to make a snug box for this piece of cheese if you do not include overlapping? Calculate your answer to the nearest tenth of a square centimetre.



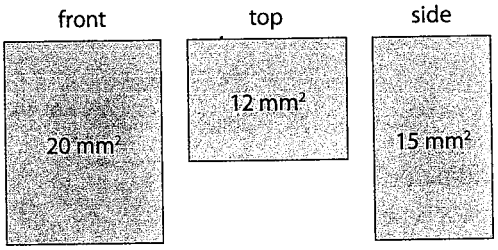
6. ✓ **Competency Check** A rectangular prism has six faces.



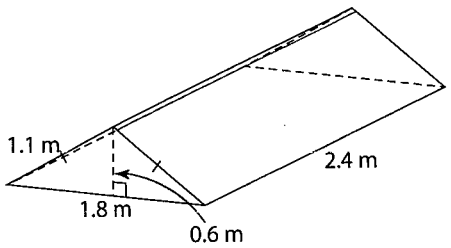
a) Why might you have to find the area of only three of the faces to be able to find the surface area? Use pictures and words to explain your thinking.

b) For what other types of prisms could you use a similar method?

7. Given the area of each face of a right rectangular prism, what is the surface area?



8. Paco is building a glass greenhouse.



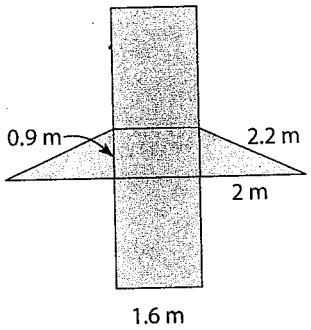
a) How many glass faces does the greenhouse have? The floor is not glass.

b) How much glass does Paco need to buy?

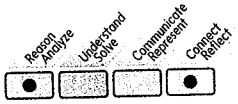
c) If glass costs $55 per square metre, how much will the glass cost Paco? What assumptions did you make?

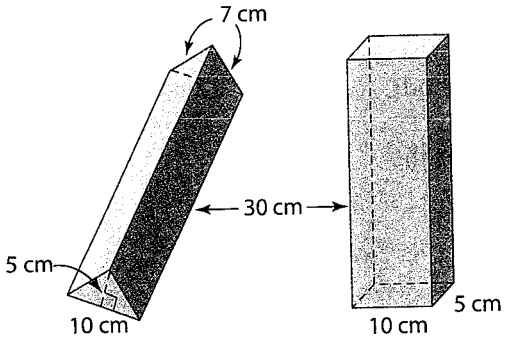
9. What is the minimum amount of material needed to make the cover for this textbook with no overlap?

10. Jay wants to make a bike ramp. He draws the following sketch. What is the surface area of the ramp?

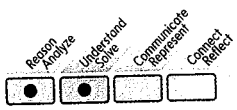


11. Tadika is wrapping a gift. Both of these containers will hold her gift. Which container would allow her to use the least amount of wrapping paper? Explain your reasoning.





12. ✓ **Competency Check** Dallas wants to paint cubes for building prisms of different sizes. The cubes measure 2 cm × 2 cm × 2 cm, 3 cm × 3 cm × 3 cm, and 4 cm × 4 cm × 4 cm, respectively.

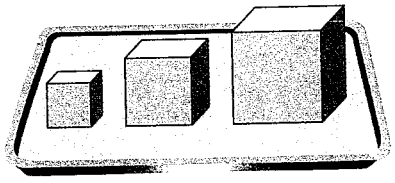


a) He paints 10 cubes of each size. What is the total surface area he must paint?

b) Describe a different strategy Dallas could use to find the surface area in order to confirm that his calculations are correct.

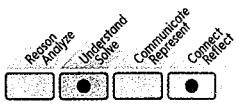
c) How does adding 1 cm to the edges of a cube change the surface area?

d) How many cubes with sides of 2 cm would it take to make a cube with a surface area the same as a cube with sides of 4 cm? Model the question with blocks if possible. Explain the reasoning for your answer.

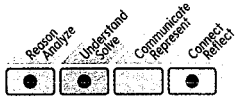


Extend

13. A square pan measures 30 cm on each side and is 5 cm deep. Cody wants to coat the inside of the pan with nonstick cooking spray. A single can of nonstick cooking spray covers an area of 400 000 cm^2. How many pans can be coated with a single can? What assumptions did you make in your answer?



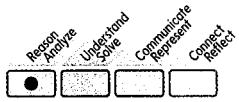
14. ✓ **Competency Check** Ethan bought 10 packages of playing cards. Each package measures 9 cm × 6.5 cm × 1.7 cm. He wants to build a container to hold all ten packages of cards.



a) What are the minimum inside dimensions of the container? What would its surface area be?

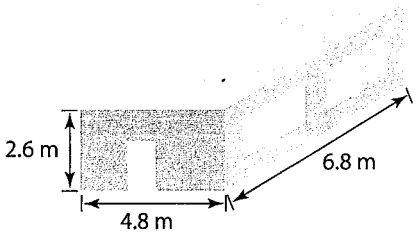
b) Is there more than one kind of container that would work? Draw diagrams to help explain your answer.

15. a) If the edge length of a cube is doubled, find the ratio of the old surface area to the new surface area.



b) What happens if the edge length of a cube is tripled? Is there a pattern?

16. Shelby wants to paint the walls and ceiling of a rectangular room.



Type of Paint	Size of Paint Can	Cost
Wall paint	4 L	$24.95
	1 L	$7.99
Ceiling paint	4 L	$32.95

One litre of paint covers 9.5 m^2.

a) What is the least amount of paint Shelby can buy to paint the room (subtract 5 m^2 for the door and windows)?

b) How much will the paint cost, not including tax?