Section 6.1 Surface Area of Prisms, Build Your Skills, p359–361
Student Resource p232–234

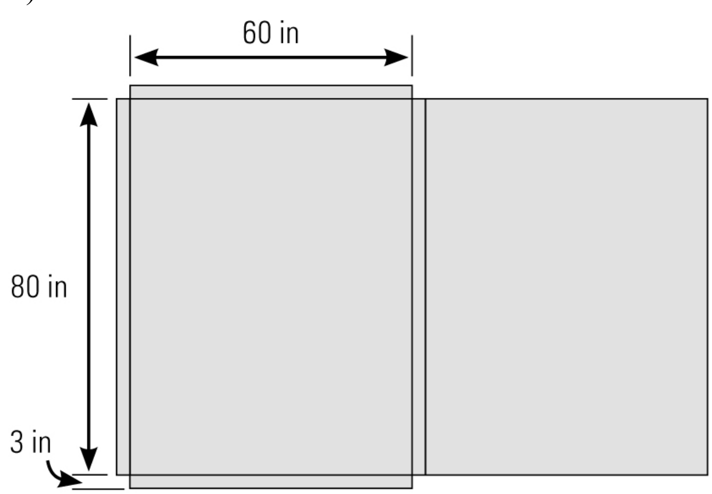
Build Your Skills

1. a) Calculate the area of siding on each side of the house and add them up.
$A = (2 \times 28 \times 6) + (2 \times 35 \times 6)$
$A = 756 \text{ ft}^2$
Darcy must paint 756 ft^2.
b) Total area of two coats:
$2 \times 756 = 1512$
Divide total area by area per can to get number of cans:

——

Round up to 7 cans.
Darcy must buy 7 cans of paint.

2. a)



b) $2 \times 80 \times 60 = 9600 \text{ in}^2$
$2 \times 80 \times 3 = 480 \text{ in}^2$
$2 \times 60 \times 3 = 360 \text{ in}^2$
$SA = 9600 + 480 + 360$
$SA = 10\,440 \text{ in}^2$
Total material needed = $10\,440 \text{ in}^2$
$10\,440 \text{ in}^2$ of canvas are needed to cover one divider.
Information about *Le Festival acadien international de Par-en-Bas* can be found at the festival's website.
http://www.festivalacadien.net/#
Information on Nova Scotia's Acadian heritage can be found at this link:
http://www.novascotia.com/en/home/discovernovascotia/ourculture/foundingcultures/acadianculture/default.aspx

Extension

Students may choose and research one of the francophone festivals that occur in their province, or within Canada. (Instead of having students research a francophone festival, you could have them research a festival that celebrates a different culture.) Ask students to research the location of the festival, when it occurs, and the activities that take place. Invite them to design a small three-dimensional, prism-shaped keepsake or souvenir that will be used to promote a specific cultural aspect of the festival (for example, one of the activities that people can enjoy there). This object could be a key chain, fridge magnet, or picture frame. Ask students to create a three-dimensional drawing of the keepsake and calculate its surface area to determine the amount of material that will be needed to manufacture it.

3. a) The area of a trapezoid is the average of the top and bottom edges times the height.
Area = ———
Area = 12 000 cm^2
The area of one face of the display case is 12 000 cm^2.
b) The case has hexagonal a top and bottom, therefore there are 6 faces.
Total area = 6 × 12 000
A = 72 000 cm^2.
Convert to metres.
——— = 7.2 m^2
She needs 7.2 m^2 of glass.

4. a) One face:
3 × 3 = 9
There are 6 faces.
6 × 9 = 54
The surface area of the crate is 54 ft^2.
b) She can cut 2 faces of the crate out of 1 sheet of plywood, so she needs 3 sheets of plywood.
c) 4 sheets + 1 sheet for the 2 ends = 5 sheets of plywood
She can now get one side face out of one sheet of plywood, but both end pieces out of one sheet, so she needs 5 sheets of plywood.
For students who determine that the second crate will not need twice the area of plywood, have them determine by what factor they could multiply each dimension to require twice the area of plywood.

5. No, this is not a reasonable estimate. The bathroom would be around 8 m × 8 m, or the size of a small apartment! Possibly, Zyanya did not check the units of the floor plan and assumed the dimensions were in metres when the plan was actually in feet. A bathroom of 64 ft^2 (8 ft × 8 ft) is not unreasonable.

6. Calculate the area of each face and add them up.
First calculate the missing dimensions x and y.
$y = 24 - 8$
$y = 16$ in
$x = 36 - 8$
$x = 28$ in
Area of face A:
$A = 36 \times 12$

$A = 432$ in^2
Area of faces B and D:
$A = (36 \times 8) + (16 \times 8)$
$A = 416$ in^2
Area of face C:
$A = 12 \times 16$
$A = 192$ in^2
Area of face E:
$A = 28 \times 12$
$A = 336$ in^2
Area of face F:
$A = 12 \times 24$
$A = 288$ in^2
Total area:
$A + B + C + D + E + F$
$432 + 416 + 416 + 192 + 336 + 288 = 2080$
Dirk needs 2080 in^2 of sheet metal.

Extend Your Thinking

7. Because the roof is corrugated, the actual surface area is greater than the area covered by the roof.
To determine the area that he should have used, calculate the length along one corrugation.
Use the Pythagorean theorem to calculate the length, L, of the slope.

$L = 5$
Determine the effective length, L_e, of each 6-inch corrugation.
$L_e = 2 \times 5$
$L_e = 10$ in
Each 6-inch corrugation is “stretched out” to 10 inches.
Calculate the number of corrugations, N, in the 25-foot length.
$N =$ —
$N = 50$ corrugations
Calculate the total effective length of the roof.
Length = 50 corrugations × 10 inches per corrugation
Length = 500 inches
500 inches = 41 feet 8 inches
Now calculate the actual area that Wolfgang should have used in the area calculation.
Area = 20 × 41.67
Area = 833.4 ft^2
The area to be painted is 66% larger than the area covered by the roof.