Chapter 2 BLM Answers

BLM 2–2 Chapter 2 Prerequisite Skills

1.

Surface Area	Volume
a) 3324 cm^2; 515.2 $in.^2$	11 880 cm^3; 725.0 $in.^3$
b) 433.5 cm^2; 67.2 $in.^2$	614.1 cm^3; 37.5 $in.^3$
c) 484 $in.^2$; 3122.6 cm^2	665.5 $in.^3$; 10 905.6 cm^3

2.

Surface Area	Volume
a) 452.4 $in.^2$; 2918.6 cm^2	703.7 $in.^3$; 11 531.9 cm^3
b) 22 776.5 cm^2; 3530.4 $in.^2$	235 619.4 cm^3; 14 378.4 $in.^3$
c) 24 328.5 cm^2 ; 3770.9 $in.^2$	267 613.4 cm^3; 16 330.8 $in.^3$
d) 251.6 cm^2; 39.0 $in.^2$	271.8 cm^3; 16.6 $in.^3$
e) 485.0 $in.^2$; 3128.9 cm^2	748.6 $in.^3$; 12 267.1 cm^3

3. Students should sketch each 3-D object.

Surface Area	Volume
a) 1226.9 cm^2	2924.2 cm^3
b) 128.3 $in.^2$	91.1 $in.^3$
c) 21 134.2 cm^2	186 902.2 cm^3
d) 5261.1 cm^2	25 192.2 cm^3
e) 2049.9 $in.^2$	6361.7 $in.^3$
f) 7783.2 cm^2	26 825.7 cm^3

4. a) 9 **b)** 5.48 **c)** 3.46 **d)** 8.12 **e)** 39.86

5. 2 m; Answers will vary. Example: a shipping box for a washing machine

6. 5 cm; Answers will vary. Example: a jewellery box for a ring

BLM 2–3 Chapter 2 Warm-Up

Section 2.1

1. a) For Ed's project, using large units, such as kilometres results in very small numbers. It would be more appropriate to measure in metres and centimetres. **b)** 23.8 m; 17.9 m

2. a) Use inches or feet, as they are smaller units than yards but large enough that most measurements can be expressed as whole numbers.

b) Students may convert all measurements to inches or feet.

13 in.	3.75 ft	$\frac{1}{3}$ yd
13 in.	45 in. (3 ft = 36 in.) + (0.75 ft = 9 in.)	12 in. (1 yd = 36 in.)
1 ft 1 in. (12 in. = 1 ft)	3.75 ft	1 ft (1 yd = 3 ft)

3. Example:

- Convert 180.3 cm by 101.6 cm to approximately 71 in. by 40 in. or 5.9 ft by 3.3 ft.
- Estimate the area to be about 6 ft by 3 ft or 18 ft^2.
- Estimate the cost to be at least (18)(75) = $1350.

4. Area is the number of square units needed to cover a surface. For example, 47 m^2 means 47 squares each with side length 1 m and area 1 m^2.

5. Volume is the amount of space that an object occupies.

Section 2.2

1. a) 90 000 cm^2. 1 m = 100 cm

b) 144 $in.^2$. 1 ft = 12 in.

2. 176 $in.^2$

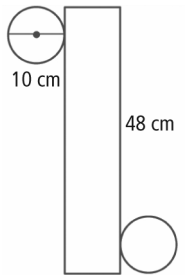
3. a)

Dimensions	1 by 17	2 by 16	3 by 15	4 by 14	5 by 13	6 by 12	7 by 11	8 by 10	9 by 9
Area (m^2)	17	32	45	56	65	72	77	80	81

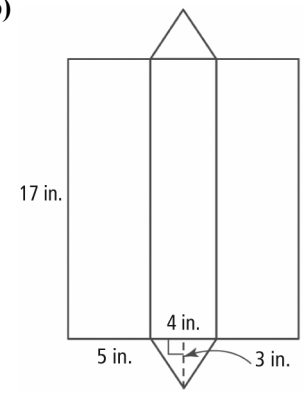
b) 9 m by 9 m gives the largest area.

4. The diameter of the circle is the length of one square multiplied by 7, as the squares and the line segments that connect them are equal in length. Half of the diameter is the radius. Substitute the value of the radius in the formula $SA = \pi r^2$ to solve the area of the circle. Then, subtract the area of the squares (or 3 times the area of one square) to find the area of the shaded portion.

5. a)



b)



Section 2.3

1. Volume is the number of cubes that fill the space that an object occupies. For example, $4m^3$ is made up of four 1-m^3 cubes. Each cube is 1 m in length by 1 m in width by 1 m in depth.

2. 1 m = 100 cm, 1 000 000 cm^3

3. Using the Pythagoras relationship, $c^2 = a^2 + b^2$; $8^2 = 4^2 + h^2$; height = 6.9 cm

4. 6 cm

5. Add the sum of the volumes of the square-based pyramid and the three prisms.

BLM 2–6 Section 2.1 Extra Practice

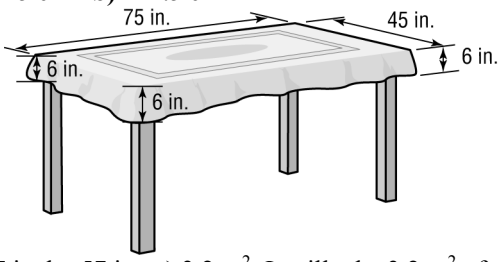
1. a) 7.4 m^2 **b)** 23 cm^2 **c)** 16 000 000 m^2 **d)** 180 m^3

2. a) 0.9 ft^2 **b)** 100.8 in^2 **c)** 4 yd^2 **d)** 1.7 ft^3

3. a) 77.4 cm^2 **b)** 3.6 yd^2 **c)** 0.8 cubic mi **d)** 0.1 m^3

4. a) 45 cm^3 **b)** 442.5 cm^3

5. a)



b) 87 in. by 57 in. **c)** 3.2 m^2; It will take 3.2 m^2 of fabric to make the tablecloth.

6. 4.9 yd^3; It will take 4.9 yd^3 of sand to fill the sandpits.

7. a) 908 cm^2; The area of the platform top is 908 cm^2.

b) smaller by approximately 21.1 cm^2

8. 42 in. or 3'6"; The floor measures 42 in. or 3'6" in width.

BLM 2–7 Investigate Surface Area of Three-Dimensional Objects

1., 2. Example:

Quadrant 1: The sum of the surface areas of all faces of a 3-D object.

Quadrant 2: Find the area of each face, and then add all the areas.

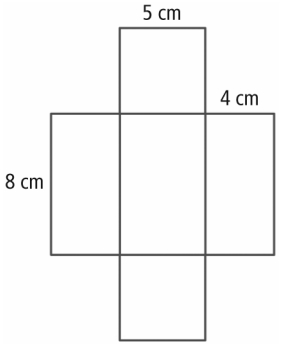
Quadrant 3: Students use strategies of their choice. They record the strategies and the results.

Example: The surface area of the cylinder is 374.7 cm^2. The surface area of the cone is 208.6 mm^2. The surface area of the prism is 348 $in.^2$.

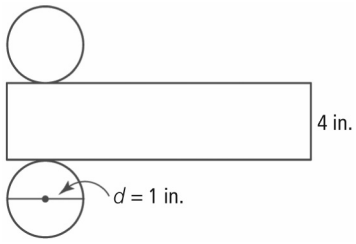
Quadrant 4: Expect a different strategy from the one shown in Quadrant 3.

BLM 2–8 Section 2.2 Extra Practice

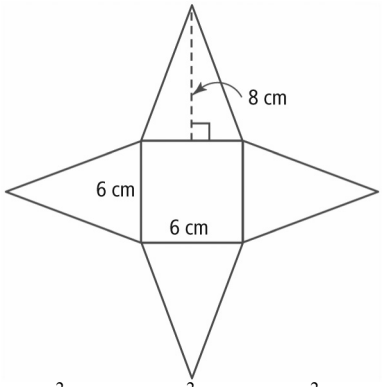
1. a)



b)

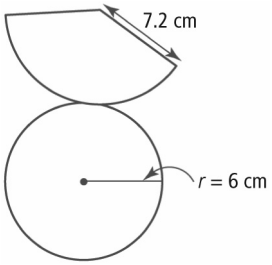


c)

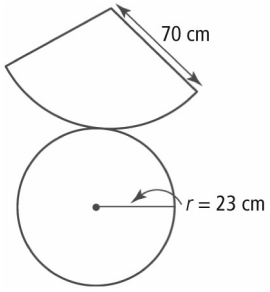


2. a) 184 cm^2 **b)** 31.4 $in.^2$ **c)** 132 cm^2

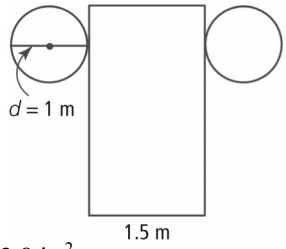
3. a) 248.8 cm^2



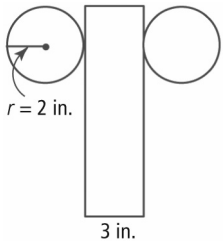
b) 6985.9 cm^2



4. a) 6.3 m^2



b) 62.8 $in.^2$



5. a) 96 cm^2 **b)** 3124 $in.^2$ **c)** 187.4 $in.^2$
6. a) 320 mm^2 **b)** 153.9 $in.^2$
7. a) 20.0 mm **b)** 23.0 **c)** 35.0 cm
8. 127.2 ft^2
9. front: 64 $in.^2$; sides: 16 $in.^2$, light cover: 12.6 $in.^2$; total surface area: 80 – 12.6 = 67.4 $in.^2$. He will need to paint an area 67.4 $in.^2$.

BLM 2–9 Section 2.3 Extra Practice

1. a) 280 $in.^3$ **b)** 3000 cm^3 **c)** 114.5 m^3 **d)** 508.9 $in.^3$ **e)** 1026.3 mm^3 **f)** 284.8 cm^3
2. 8.8 in. The microwave is 8.8 in. tall.
3. 2144.7 cm^3. The volume of the globe is 2144.7 cm^3.
4. 11.5 in. The beach ball is 11.5 in. in diameter.
5. a) 1.5 m **b)** 4 cm **c)** 0.75 ft **d)** 12.0 cm
6. 1.02 ft^3
7. base: 12 $in.^3$; roof: 9 $in.^3$; total volume: 21 $in.^3$. The total volume of wood used is 21 $in.^3$.
8. a) 1 in. The sphere is 1 in. in diameter.
b) 4 in. The pyramid is 4 in. in height.
c) 1.5 in. The pyramid base is 1.5 in. wide.
d) 22.5 $in.^3$ The volume of packaging needed is 22.5 $in.^3$.

BLM 2–10 Chapter 2 Test

1. A **2.** C **3.** C **4.** C **5.** A **6.** D
7. a) 226.2 m^2 **b)** 209.4 m^3
8. 8 cm **9.** 1.625 yd
10. a) 5.5 cm^3 **b)** 282.2 cm^3 **c)** approximately 3 times as great
11. a) 1571 $cm^3 \approx$ 524 cm^3
b) 2453.6 $cm^2 \approx$ 2454 cm^2