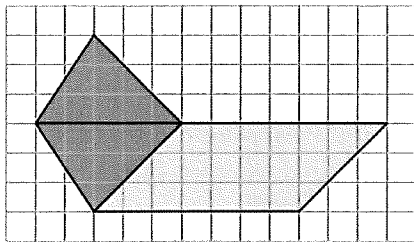


# Looking Back Answers

1. a.  $36 \text{ cm}^2$

- b. Answers will vary. First possible answer: Subdivide the hexagon into triangles, parallelograms, and rectangles and use the formulas for finding area of these figures. An example of subdivision is shown.

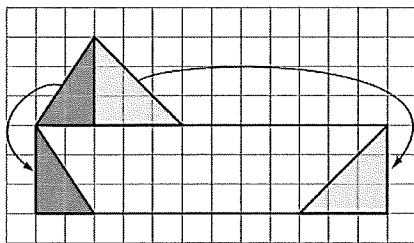


$$\begin{aligned} \text{area of triangle} &= \text{base} \times \text{height} \div 2 \\ &= 5 \times 3 \div 2 = 7.5 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{area of parallelogram} &= \\ \text{base} \times \text{height} &= 7 \times 3 = 21 \text{ cm}^2 \end{aligned}$$

Since there are two triangles and one parallelogram,  
 $7.5 + 7.5 + 21 = 36 \text{ cm}^2$ .

Second possible answer: Rearrange the hexagon into a long rectangle and count the number of square centimeters.



2. a.  $6 \times 6 \times 7.5 = 270 \text{ in.}^2$

b. 
$$\begin{aligned} 2(6 \times 6) + 4(6 \times 7.5) &= 2(36) + 4(45) \\ &= 72 + 180 \\ &= 252 \text{ in.}^2 \end{aligned}$$

3. 
$$\begin{aligned} &(3 \times 4 \times \frac{1}{2}) + (3 \times 4 \times \frac{1}{2}) + \\ &(3 \times 6.5) + (4 \times 6.5) + (5 \times 6.5) \\ &= 6 + 6 + 19.5 + 26 + 32.5 \\ &= 90 \text{ cm}^2 \end{aligned}$$

4. a. Rectangle: area = length  $\times$  width or base  $\times$  height, measured in square units; perimeter = (length + width)  $\times$  2, measurement is a length such as inches

- b. Triangle: area = base  $\times$  height  $\div$  2, measured in square units; perimeter = add the lengths of the three sides, measurement is a length, such as inches

- c. Parallelogram: area = base  $\times$  height, measured in square units; perimeter = add the lengths of the four sides or add the lengths of two adjacent sides and double, measurement is a length, such as inches

5. Rectangle: Area is the number of square units covering the shape. The length of the base is the number of units along the base. The height tells how many rows of those units there are. If you multiply the number of units in a row (base) by the number of rows (height), you get the total square units covering the rectangle. Perimeter is the total length of the outside edges of a shape. You can add the length of the sides, or since opposite sides are congruent, you can add two adjacent sides to get the distance halfway around and then double this for the total distance.

Triangle: The area of a triangle is half the area of a rectangle because if you multiply the base (square units along base) by the height (number of rows of

## Looking Back Answers *(continued)*

square units), that gives you the area of the rectangle. Then divide it by 2 to get the area of the triangle. Perimeter: You add the length of the three edges to get the total distance around the shape.

Parallelogram: The area of a parallelogram can be divided into two congruent triangles with the same base and height as the parallelogram. Since there are two triangles in one parallelogram, you do not divide the product of the base and height by two. Perimeter is the total length of the outside edges of a shape. You can add the lengths of the sides, or since opposite sides are congruent, you can add two adjacent sides to get the distance halfway around and then double this for the total distance.

6. A triangle has half the area of a rectangle with the same base and height. So we developed the formula for area of a triangle by comparing areas of triangles on a grid with the areas of the rectangles drawn around them. We discovered that two of the same triangle can fit inside a rectangle with the same base and height as the triangle.

The diagonal of a parallelogram divides a rectangle into two congruent triangles with the same base and height as the parallelogram. So we developed the formula for area of a parallelogram by comparing the areas of two congruent triangles with the area of a

parallelogram with the same base and height as the triangles. Since the area of a parallelogram is twice that of its triangles, the area of a parallelogram must be equal to the area of a rectangle with the same base and height. This makes sense because a parallelogram can also be rearranged to form a rectangle with the same base and height.

**Note:** In the seventh-grade Unit *Filling and Wrapping*, the area of a circle is also developed from the area of a rectangle.

7. The surface area of a prism is equal to the sum of the area of all of its faces. You can also think of the surface area as the total area covered by the net of prism.

A rectangular prism has six rectangular faces. Suppose those faces are 4 by 6, 4 by 6, 4 by 7, 4 by 7, 6 by 7, and 6 by 7. Then the total surface area is

$$24 + 24 + 28 + 28 + 42 + 42 = 188 \text{ square units.}$$

The volume of a three-dimensional figure is the amount of space within it. That is, the volume of a polyhedron is equal to the number of unit cubes that can fit inside it. Suppose the length, width, and height of a rectangular prism are 4, 6, and 7 units. Then the total number of unit cubes is

$$\text{length} \times \text{width} \times \text{height, or } 4 \times 6 \times 7 = 168 \text{ cubic units.}$$