A net is a two-dimensional model that can be folded into a three-dimensional figure. Prisms are three-dimensional figures that have two congruent and parallel faces that are polygons, such as rectangles or triangles. The rest of a prism’s faces are parallelograms. You can use nets of rectangular and triangular prisms to find their surface areas.

Ashley cuts nets from poster board and folds them to make three-dimensional models of buildings.

A. Ashley first cuts out the net shown at the right.
   1. What three-dimensional figure can she fold from this net?
   2. Ashley knows that she can use the formula \( A = lw \) to find the area of a rectangle, where \( l \) represents the rectangle’s length and \( w \) represents its width. Explain how to find the total area of the net.
   3. What is the area of the net?
   4. How is the area of the net related to the surface area of the prism?

B. Ashley wants to model the roof of a building. The triangular faces of the figure are parallel right triangles.
   1. Draw a net of the figure. Label the lengths of the sides.
   2. Explain how you can use the net to find the figure’s surface area.
   3. What is the surface area? Remember that the formula \( A = \frac{1}{2}bh \) is used to find the area of a triangle with a base \( b \) and a height \( h \).
Remember that you can find the volume of a rectangular prism by multiplying the area of its base by its height. Use one of these formulas:

\[ V = Bh, \] where \( B \) is the area of the base, and \( h \) is the height, or

\[ V = lwh, \] where \( l \) and \( w \) are the length and width of the base, and \( h \) is the height.

### Problem 4.2

Ashley and Brandon use various cubic blocks to model some of the buildings near their school.

A. Ashley’s blocks are \( \frac{1}{2} \) inch on each side.

She starts her model by making a 5-inch by 3-inch rectangular base with the blocks.

1. How many blocks does she use?
2. Ashley adds 9 more layers to the base layer. How many blocks does she use in all?
3. What are the length \((l)\), width \((w)\), and height \((h)\) of the model, in inches?
4. Use the formula \( V = lwh \) to find the volume, in cubic inches, of one of Ashley’s blocks. Show your work.
5. Use the formula \( V = lwh \) to find the volume, in cubic inches, of Ashley’s model. Show your work.
6. How is the volume of 1 block related to the volume of a block that measures 1 in. on each side?
7. Look at the volume of each block, the number of blocks used, and the volume of the model. How are these numbers related?
B. Brandon measures his blocks to be $\frac{1}{4}$ inch on each side. He models a building in the shape of a rectangular prism that is $2\frac{1}{2}$ in. wide, 3 in. long, and $6\frac{3}{4}$ in. high.

1. How many blocks wide and long is the base of Brandon’s model?
2. What is the area, in square inches, of the model’s base?
3. How many blocks tall is the model?
4. How many blocks did Brandon use for the model?
5. Use the formula $V = Bh$ to find the volume, in cubic inches, of one of Brandon’s blocks. Show your work.
6. Use the formula $V = Bh$ to find the volume, in cubic inches, of Brandon’s model. Show your work.
7. How is the volume of 1 block related to the volume of a block that measures 1 in. on each side?
8. Look at the volume of each block, the number of blocks used, and the volume of the model. How are these numbers related?

**Exercises**

1. Draw the three-dimensional figure modeled by this net.

   ![Net](image)

Name the two-dimensional shapes used to make the faces of each object. Tell how many there are of each shape.

2. a rectangular prism, such as a shoebox
3. a triangular prism, like a tent
4. a pyramid, like the structures built by the Egyptians
Draw a net for each figure.

5.

6.

Find the surface area of each figure.

9.

10.

11.

12.

13. A container has two rectangular ends that measure 4 ft by 6 ft, and another side that has a length of 12 ft.
   a. What are the measurements of each of the faces of the container?
   b. What are the areas of all of the faces of the container?
   c. What is the total surface area of the container?

14. Keira has 750 square inches of wrapping paper. Her package is shaped like a right rectangular prism that is 15 inches long, 12 inches wide, and 8 inches high. Does she have enough paper to cover her package? Explain.
15. The pyramid at the right has four faces that are congruent triangles.
   a. What shape is the base of the pyramid?
   b. If you know just the length of a side of the base, do you have enough information to find the surface area of the pyramid? Explain.

Find the volume of each rectangular prism.

16. 17.

18. 19.

For Exercises 20–22, each rectangular prism is built with $\frac{1}{2}$-in. blocks. Find the length, width, height, and volume of the prism.

20. 21. 22.
23. **a.** What size cubic blocks would you use to make a rectangular prism that is $2\frac{1}{2}$ in. by $3\frac{1}{2}$ in. by 4 in.? Explain your choice.

**b.** How many blocks would you need?

**c.** Give the volume of the model in cubic inches.

24. **Multiple Choice** Which set of dimensions describes the rectangular prism with the greatest volume?

   **A.** $3\frac{1}{2}$ in. by 2 in. by 5 in.

   **B.** 3 in. by 3 in. by $3\frac{1}{2}$ in.

   **C.** 4 in. by 2 in. by 4 in.

   **D.** $2\frac{1}{4}$ in. by 2 in. by 7 in.

25. Megan uses 216 cubic blocks to make a rectangular prism 9 blocks long and 3 blocks tall. Each block measures $\frac{1}{4}$ inch on each side.

   **a.** How many blocks wide is the prism?

   **b.** What are the prism’s dimensions in inches?

   **c.** What is the prism’s volume, in cubic inches?

   **d.** Megan uses all of the bricks to make a new prism that is 6 bricks tall. Give 3 possible sets of dimensions of the base of the prism Megan could have made.
A box plot is constructed from the **five-number summary**: the minimum value, lower quartile, median, upper quartile, and maximum value.

The Panthers scored the following numbers of points during games this season:

68 91 86 89 88 82 95 85 80 78 82
68 86 96 73 68 91 80 90 86 72 87

**A.** Order the set of data from the least to the greatest. What are the minimum and maximum values?

**B.** Find the median. Explain how you found this value.

**C.** The **lower quartile** is the median of the lower half of the scores. What is the lower quartile of the data?

**D.** The **upper quartile** is the median of the upper half of the scores. What is the upper quartile of the data?

**E. 1.** Find the difference between the upper quartile and the lower quartile. This difference is called the **interquartile range**.

2. What does the interquartile range represent?

**F. 1.** Draw a number line from 60 to 100.

2. Above your number line, draw vertical line segments at the values you found for the median, the lower quartile, and the upper quartile.

3. Connect the vertical lines to form a rectangle.

4. Locate the value you identified as the minimum and draw a line to the left from the rectangle to meet that point.

5. Locate the value you identified as the maximum and draw a line to the right from the rectangle to meet that point.