Student Guide

Questions 1–5 (SG pp. 63–64)

1.* 12 inches

2.* 8 square inches

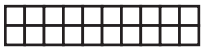
3. A.* Yes, 1 × 5 inches and 3 × 3 inches

B. 5 square inches and 9 square inches

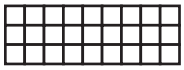
C.* Answers will vary. Students may think that a square helipad is better for helicopters than a rectangular helipad. Accept all answers.

4. A–B.

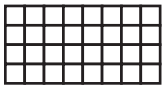
L = 11 inches, *W* = 1 inch, *A* = 11 square inches



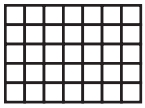
L = 10 inches, *W* = 2 inches, *A* = 20 square inches



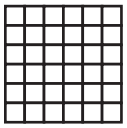
L = 9 inches, *W* = 3 inches, *A* = 27 square inches



L = 8 inches, *W* = 4 inches, *A* = 32 square inches



L = 7 inches, *W* = 5 inches, *A* = 35 square inches



L = 6 inches, *W* = 6 inches, *A* = 36 square inches

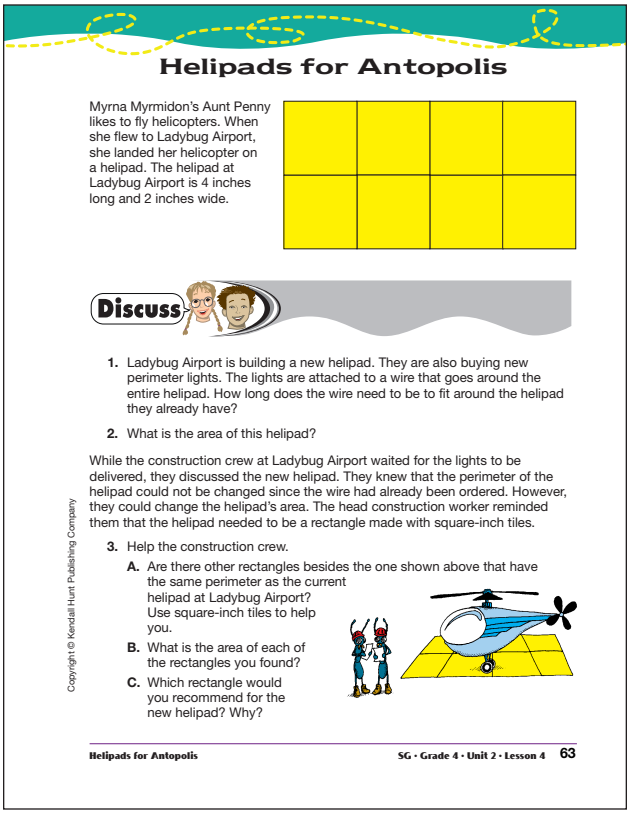
C.* See Figure 2 in lesson 4

D.* 6 inch × 6 inch; 36 square inches

E.* Possible response: I made a data table showing all the possible rectangles you can make that have P = 24 inches. The one with the most area is the 6" × 6" square.

F.* 6 inch × 6 inch rectangle is a square.

G.* The 1 inch × 11 inch rectangle is long and skinny.



Helipads for Antopolis

Myrna Myrmidon's Aunt Penny likes to fly helicopters. When she flew to Ladybug Airport, she landed her helicopter on a helipad. The helipad at Ladybug Airport is 4 inches long and 2 inches wide.

Discuss

1. Ladybug Airport is building a new helipad. They are also buying new perimeter lights. The lights are attached to a wire that goes around the entire helipad. How long does the wire need to be to fit around the helipad they already have?
2. What is the area of this helipad?

While the construction crew at Ladybug Airport waited for the lights to be delivered, they discussed the new helipad. They knew that the perimeter of the helipad could not be changed since the wire had already been ordered. However, they could change the helipad's area. The head construction worker reminded them that the helipad needed to be a rectangle made with square-inch tiles.

3. Help the construction crew.
   - **A.** Are there other rectangles besides the one shown above that have the same perimeter as the current helipad at Ladybug Airport? Use square-inch tiles to help you.
   - **B.** What is the area of each of the rectangles you found?
   - **C.** Which rectangle would you recommend for the new helipad? Why?

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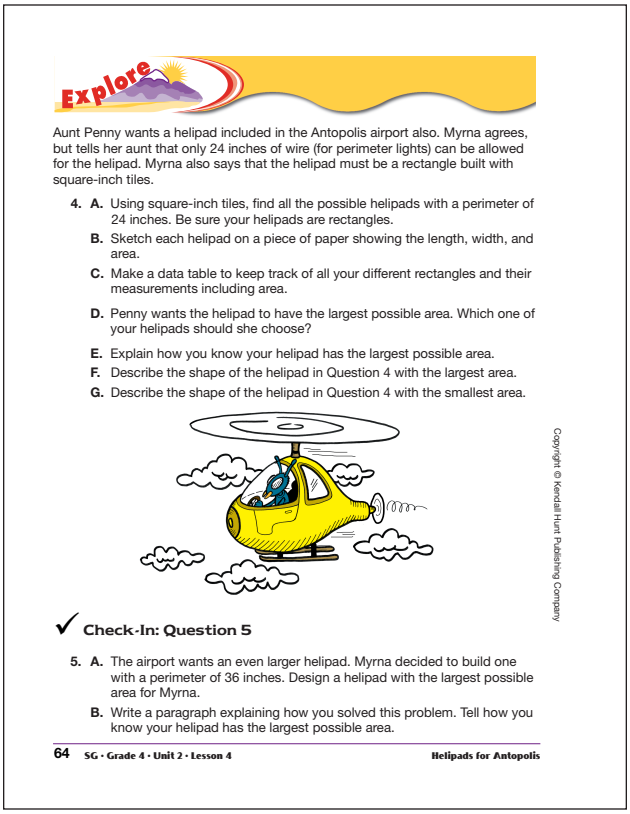

Explore

Aunt Penny wants a helipad included in the Antopolis airport also. Myrna agrees, but tells her aunt that only 24 inches of wire (for perimeter lights) can be allowed for the helipad. Myrna also says that the helipad must be a rectangle built with square-inch tiles.

4. **A.** Using square-inch tiles, find all the possible helipads with a perimeter of 24 inches. Be sure your helipads are rectangles.
   - **B.** Sketch each helipad on a piece of paper showing the length, width, and area.
   - **C.** Make a data table to keep track of all your different rectangles and their measurements including area.
   - **D.** Penny wants the helipad to have the largest possible area. Which one of your helipads should she choose?
   - **E.** Explain how you know your helipad has the largest possible area.
   - **F.** Describe the shape of the helipad in Question 4 with the largest area.
   - **G.** Describe the shape of the helipad in Question 4 with the smallest area.

✓ Check-In: Question 5

5. **A.** The airport wants an even larger helipad. Myrna decided to build one with a perimeter of 36 inches. Design a helipad with the largest possible area for Myrna.
   - **B.** Write a paragraph explaining how you solved this problem. Tell how you know your helipad has the largest possible area.

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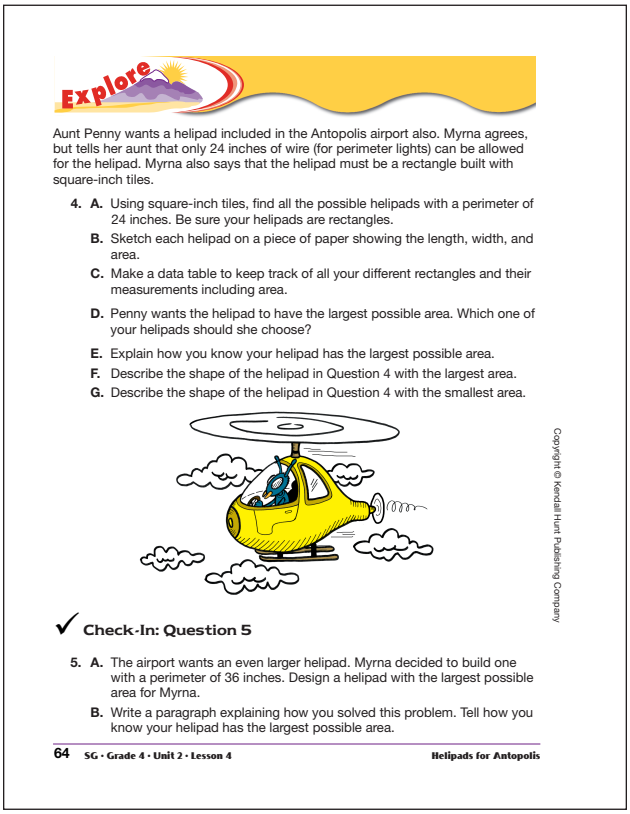
***Answers and/or discussion are included in the lesson.**



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5. **A.** 9 inch × 9 inch rectangle

   B. Answers will vary. Students should identify the 9 × 9 square as the largest rectangle having a perimeter of 36 inches. In student explanations, look for descriptions of the steps performed while solving the problem, as well as dimensions of other rectangles with perimeters of 36 inches but with areas smaller than the 9 × 9 rectangle. Students can show how they checked whether a particular rectangle has a perimeter of 36 inches by writing a number sentence. Check that students label numbers appropriately, square inches for area and inches for perimeter.