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$P = 4$   
 $A = C$   
 $A = 4C$   $A = 9C$

**2 ACTIVITY: Finding Patterns for Perimeters**





Work with a partner. Complete the table for the perimeters of the figures in Activity 1. Describe the pattern.

Figure	Original Side Lengths	Double Side Lengths	Triple Side Lengths	Quadruple Side Lengths
	$P = 4$	$P = 8$	$P = 12$	$P = 16$
	$P = 3$	$P = 6$	$P = 9$	$P = 12$
	$P = 6$	$P = 12$	$P = 18$	$P = 24$
	$P = 4$	$P = 8$	$P = 12$	$P = 16$

**Pattern: Perimeter is multiplied by same number.**

**3 ACTIVITY: Finding Patterns for Areas**

Work with a partner. Complete the table for the areas of the figures in Activity 1. Describe the pattern.

Figure	Original Side Lengths	Double Side Lengths	Triple Side Lengths	Quadruple Side Lengths
	$A = 1$	$A = 4$	$A = 9$	$A = 16$
	$A = B$	$A = 4B$	$A = 9B$	$A = 16B$
	$A = 2$	$A = 8$	$A = 18$	$A = 32$
	$A = C$	$A = 4C$	$A = 9C$	$A = 16C$

**Pattern: Area is multiplied by the square of the number.**

**What Is Your Answer?**

4. **IN YOUR OWN WORDS** How do changes in dimensions of similar geometric figures affect the perimeters and areas of the figures?

**Perimeter is changed by the same number.  
 Area is changed by the square of the number.**



## Vocabulary and Concept Check

1. The ratio of the perimeters is equal to the ratio of the corresponding side lengths.
2. The ratio of the areas is equal to the square of the ratio of the corresponding side lengths.
3.  $120 \text{ in.}^2$ ; Because the ratio of the corresponding side lengths is  $\frac{1}{2}$ , the ratio of the areas is equal to  $\left(\frac{1}{2}\right)^2$ . To find the area, solve the proportion  $\frac{30}{x} = \frac{1}{4}$ .



## Practice and Problem Solving

4.  $\frac{11}{6}; \frac{121}{36}$
5.  $\frac{5}{8}; \frac{25}{64}$
6.  $\frac{4}{7}; \frac{16}{49}$
7.  $\frac{14}{9}; \frac{196}{81}$
8. perimeter doubles
9. perimeter triples
10. area quadruples
11. area is 16 times larger
12.  $100 : 49$
13. 45 in.
14. true; Because the triangles are similar, the ratio of the perimeters is equal to the ratio of the corresponding side lengths.
15. false;  $\frac{\text{Area of } \triangle ABC}{\text{Area of } \triangle DEF} = \left(\frac{AB}{DE}\right)^2$



## Vocabulary and Concept Check

1. You can set up a proportion and solve for the unknown measure.
2. All of them except the doorway because the others are large measurements and would be hard to measure directly.



## Practice and Problem Solving

3. 15
4.  $6\frac{2}{3}$
5. 14.4
6. 14
7. 8.4
8. 25.6
9. 35 ft
10. 39 in.