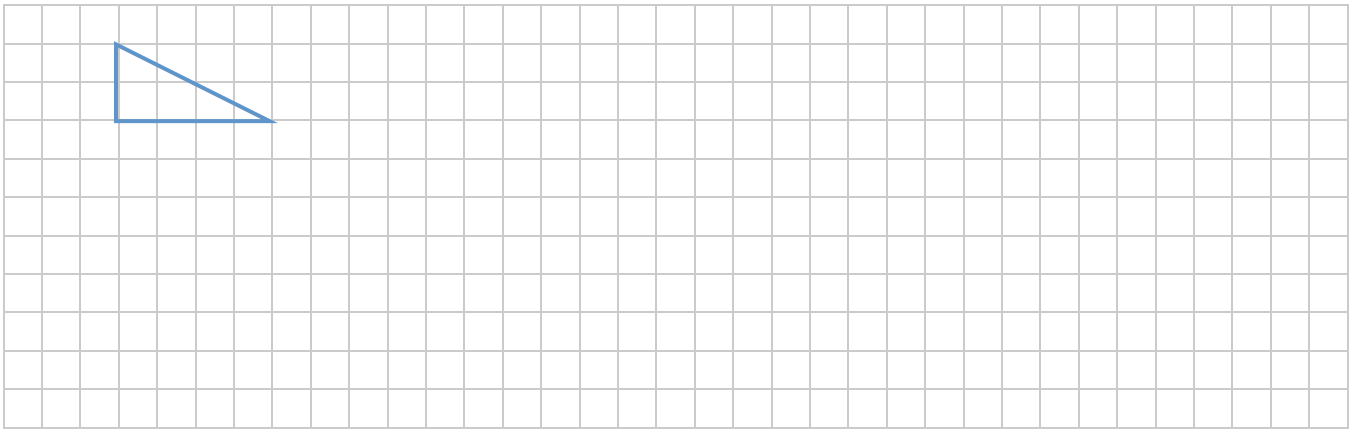
Changing Dimension: Area
Extend Your Learning

When you multiply the dimensions of a rectangle by n, the area of the new rectangle is n^2 times as large. When the scale factor is n, the area factor is n^2. Use the following problems to investigate if this relationship is true for other shapes.

1. Sketch three different triangles that are similar to the one shown below using the following directions.
   Triangle 1: Double the base and the height.
   Triangle 2: Triple the base and the height.
   Triangle 3: Quadruple the base and the height.



2. The area of the original triangle is 4 square units. Find the area of each triangle you drew.

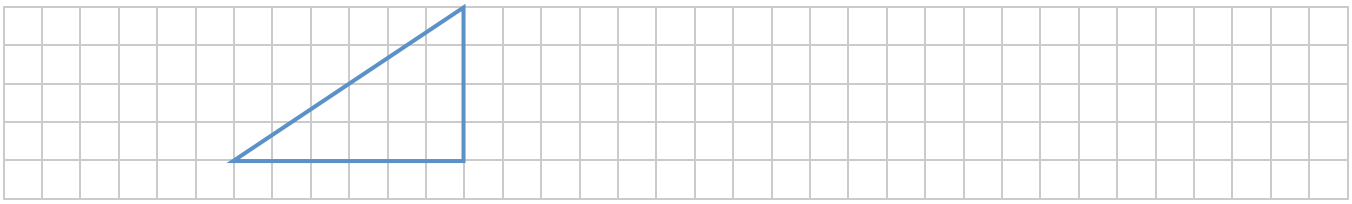
3. Describe how the area of a triangle changes when you double the dimensions.

4. Describe how the area of a triangle changes when you triple the dimensions.

5. Describe how the area of a triangle changes when you quadruple the dimensions.

6. Describe how the area of a triangle changes when you make the dimensions n times as large.

7. Sketch a triangle that is similar to the following triangle. Make the base and height ½ of the original base and height. What happens to the area of a triangle when you make the dimensions ½ as large?

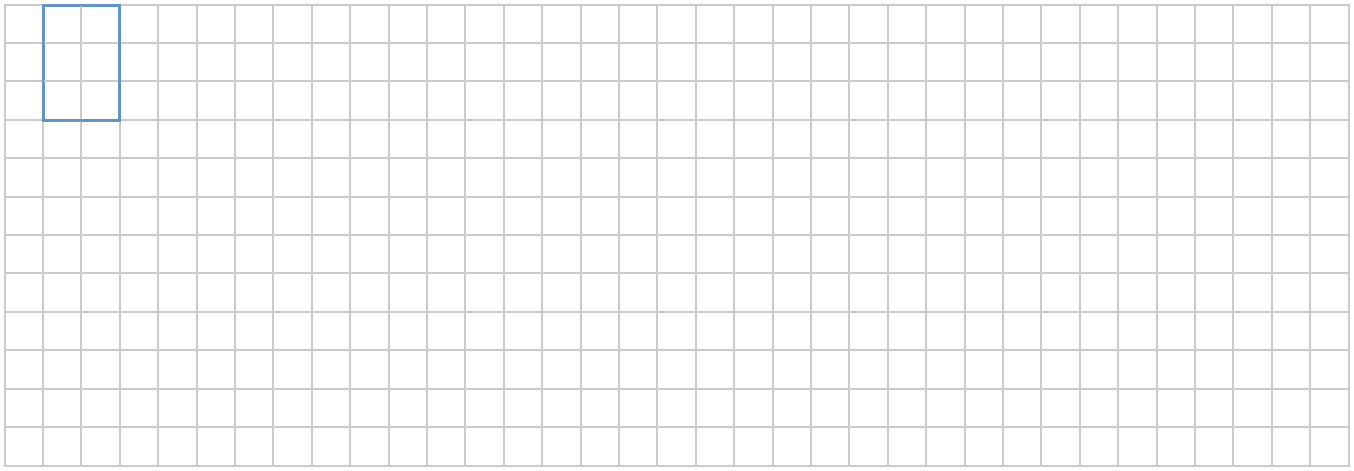


8. Do you think this pattern will hold for all types of triangles? Why or why not? Use the grid below to draw an example to justify your answer.

9. The Cookie Factory has decided to make large round cookies for special events and holidays. They are trying to decide on a fair price for the cookies. A regular cookie has a radius of 2 in. and costs $0.85. The large cookie will have a radius of 6 in. What is a fair price?

Use the following problems to investigate what happens if you multiply the two dimensions of a rectangle by different numbers.

10. Sketch three different rectangles that are similar to the one shown below using the following directions:
    Rectangle 1: Make the base two times as long and the height four times as long.
    Rectangle 2: Make the base three times as long and the height two times as long.
    Rectangle 3: Make the base four times as long and the height three times as long.



11. How does the area of rectangle 1 compare to the area of the original rectangle?

12. How does the area of rectangle 2 compare to the area of the original rectangle?

13. How does the area of rectangle 3 compare to the area of the original rectangle?

14. What happens to the area of a rectangle when one dimension is n times as large and the other dimension is m times as large?