

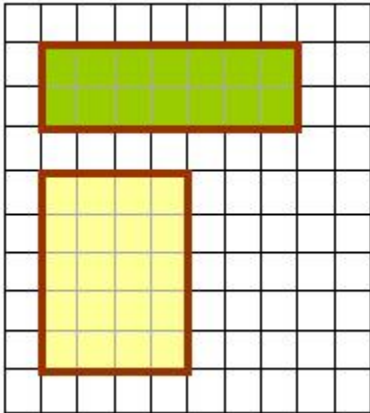
PERIMETER AND AREA

EFFECTS OF DOUBLING DIMENSIONS

We will first look at some comparisons of perimeter and area where the perimeters are the same, but the areas are different, and vice versa. Then we will examine the effects on the perimeter and area when the dimensions are doubled.

Perimeter and Area

In this first example, the perimeters are the same, but the areas are different.



Calculate the perimeter of both rectangles.

Green Rectangle

$$P = 2 \times 1 + 2 \times w$$

$$P = 2 \times 7 + 2 \times 2$$

$$P = 14 + 4$$

$$P = 18 \text{ units}$$

Yellow Rectangle

$$P = 2 \times 1 + 2 \times w$$

$$P = 2 \times 4 + 2 \times 5$$

$$P = 8 + 10$$

$$P = 18 \text{ units.}$$

Calculate the area of both rectangles

Green Rectangle

$$A = 1 \times w$$

$$A = 7 \times 2$$

$$A = 14 \text{ square units}$$

Yellow Rectangle

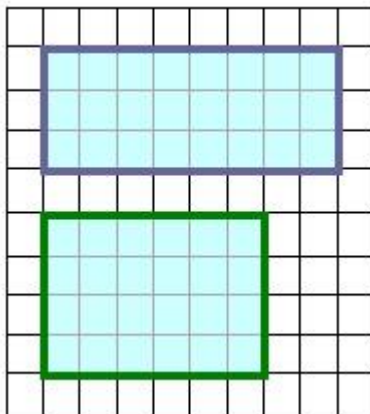
$$A = 1 \times w$$

$$A = 4 \times 5$$

$$A = 20 \text{ square units.}$$

Notice that the **perimeters** are the same, but the **areas** are different.

In this example the areas are the same, but the perimeters are different.



Calculate the perimeter of both rectangles.

Blue Border

$$P = 2 \times 1 + 2 \times w$$

$$P = 2 \times 8 + 2 \times 3$$

$$P = 16 + 6$$

$$P = 22 \text{ units}$$

Green Border

$$P = 2 \times 1 + 2 \times w$$

$$P = 2 \times 6 + 2 \times 4$$

$$P = 12 + 8$$

$$P = 20 \text{ units.}$$

Calculate the area of both rectangles

Blue Border

$$A = 1 \times w$$

$$A = 8 \times 3$$

$$A = 24 \text{ square units}$$

Green Border

$$A = 1 \times w$$

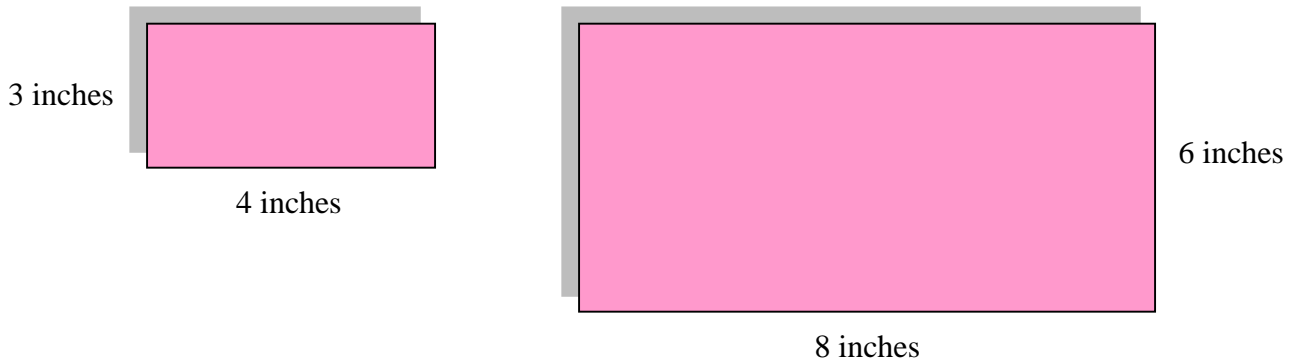
$$A = 6 \times 4$$

$$A = 24 \text{ square units.}$$

Notice that the **areas** are the same, but the **perimeters** are different.

Effects of Doubling Dimensions

Suppose you have a rectangle that measures 4 inches by 3 inches. Then, you doubled each dimension, so that the length would be 8 inches and the width would be 6 inches. What effect would this have on the area of the rectangle?

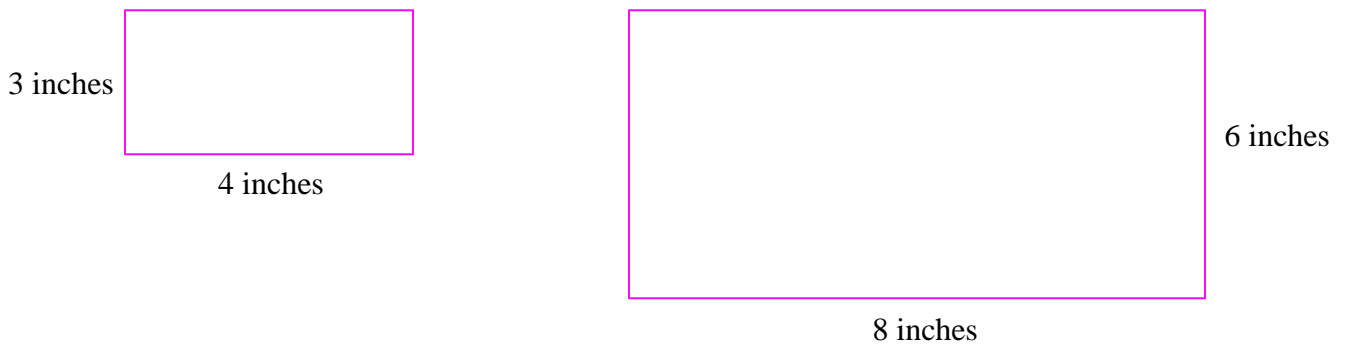


$$A = l \times w$$
$$A = 3 \times 4$$
$$A = 12 \text{ square inches}$$

The larger rectangle's area is **four** times the area of the smaller one because $12 \times 4 = 48$.

$$A = l \times w$$
$$A = 8 \times 6$$
$$A = 48 \text{ square inches}$$

What effect would doubling of the units have on the perimeter of the rectangle?



$$P = (2 \times l) + (2 \times w)$$
$$P = (2 \times 4) + (2 \times 3)$$
$$P = 8 + 6$$
$$P = 14 \text{ inches}$$

The larger rectangle's perimeter is **two** times the perimeter of the smaller one because $14 \times 2 = 28$.

$$P = (2 \times l) + (2 \times w)$$
$$P = (2 \times 8) + (2 \times 6)$$
$$P = 16 + 12$$
$$P = 28 \text{ inches}$$