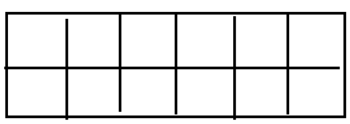
Geometry, *you can do it!*
Area: Rectangles & Parallelograms

One way to describe the size of a room is by naming its dimensions. So a room that measures 12 ft. by 10 ft. would be described by saying its a 12 by 10 foot room. That's easy enough.

There is nothing wrong with that description. In geometry, rather than talking about a room, we might talk about the size of a polygonal region.

For instance, let's say I have a closet with dimensions 2 feet by 6 feet. That's the size of the closet. Someone else might choose to describe the closet by determining how many tiles it would take to cover the floor.

To demonstrate, let me divide that closet into one foot squares.

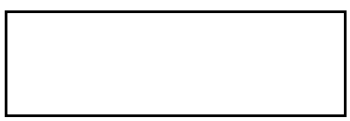


By simply counting the number of squares that fit inside that region, we find there are 12 squares.

That's interesting because if I asked you to determine how many squares would fit into other polygons shaped like that, you'd be able to find that answer by multiplying the dimensions. We'll call that shape a **RECTANGLE**.

That leads us to a shortcut described by the following postulate.

Postulate
The area of a rectangle is equal to the product of the length of the base and the length of a height to that base.



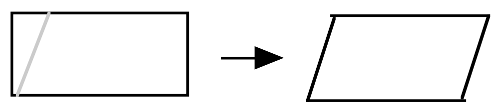
Putting this into perspective, we see the number of squares that fit inside a polygonal region is referred to as the **area**. A shortcut to determine that number of squares is to multiply the base by the height.

That is; **A = bh**. Most books refer to the longer side of a rectangle as the length (l), the shorter side as the width (w). That results in the formula

A = lw

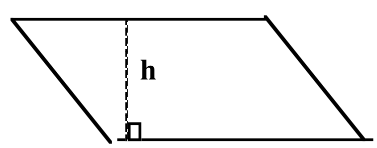
The answer in an area problem is always given in square measure because we are determining how many squares fit inside the region.

If I were to take a rectangle and slice a piece off one side and attach it the other side, do you think the area would change?



The area does not change. That's good news because we can use the previous formula. But, the shape has changed, so we need to name that differently.

A quadrilateral in which both pairs of opposite sides are parallel is a **PARALLELOGRAM.**



Theorem
The area of a parallelogram is equal to the product of the length of the base and the length of the corresponding height.
A = b h

The height is always the <u>shortest</u> distance from top to bottom.