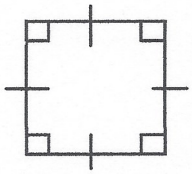
## ***Section 1.1 – Square Numbers and Area Models***



*Discuss page 4 and 5*

**Recall:**

A **quadrilateral** is a Geometrical shape with 4 side lengths.

A **square** is a quadrilateral of equal side lengths.

A square can also be referred to as a Rectangle.

A **rectangle** has two pairs of equal side lengths.

**Is every square a rectangle?**

Yes

**Is every rectangle a square?**

NO

*Investigation P.6*

How is the side length of a square related to its area???

If Area = base × height and base = height

the $A = x \cdot x$ $A = x^2$, so $x = \sqrt{A}$

**Remember:**

Area of a square $\underbrace{\text{Base}}_{a} \times \underbrace{\text{height}}_{a} = a^2$

Area of a rectangle: Base × height

Area of a parallelogram: Base × height

Area is always denoted in units squared. i.e.: $cm^2$, $m^2$, $mm^2$

**Perfect Squares:**

When a number is multiplied by itself, the result is the square of that number.

Whole numbers multiply by themselves to produce Perfect Square Numbers.

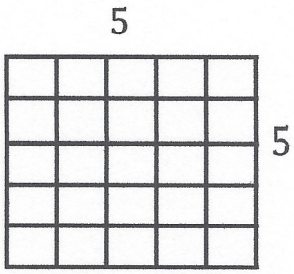
Example: $1 \times 1 = 1, 2 \times 2 = 4, 3 \times 3 = 9, 4 \times 4 = 16, 5 \times 5 = 25 \ldots$

Example

$$4^2 = 4 \times 4 = 16$$

16 is a PERFECT SQUARE, because it is the product of two identical numbers (4 x 4 = 16)

We can model perfect squares as such:




Power $\{5^2$

**Exponent:** indicates the number of times the base is multiplied by itself

**Base:** the number that is multiplied repeatedly by itself as indicated by the exponent.

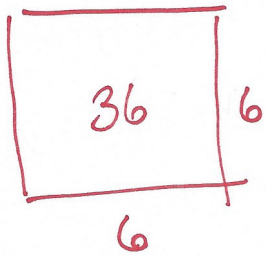
**Example:**

Show that 36 is a square number. Use a diagram, symbols, and words.

- First, let's check its factors:

  36 – 1, 36
  2, 18
  3, 12
  4, 9
  $\boxed{6, 6}$ This counts as 1. So factors are odd. this is a perfect square

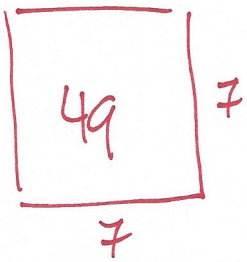
- 36 is the product of 6 times itself.

- 


  since 36 is the area of a square, then side length $= \sqrt{36} = 6$

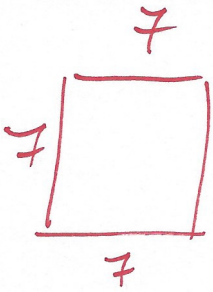
**Example 2:**

If a square picture has an area of 49 units$^2$, what is its side length?




If the area of a square is 49, it means that side length $= \sqrt{49} =$ 7 units

What would be the perimeter?




$= 7 + 7 + 7 + 7 = 7 \times 4 = 28$

**Textbook:** Page 8-9 #'s, 2, 3, 5, 8, 9, 11, 12, 14, 17