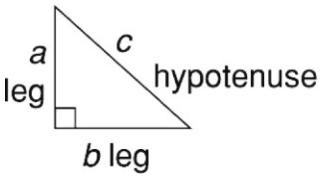
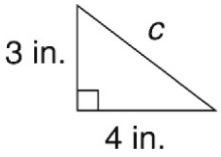
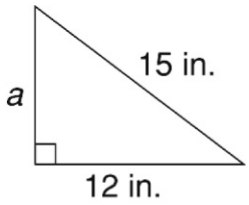
The Pythagorean Theorem

Essential Question: **How can you prove the Pythagorean Theorem and use it to solve problems?**

Learning Goal: Students will be able to apply the Pythagorean Theorem to determine the unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. **MAFS.8.G.2.7 and MAFS.8.G.2.6**

Math Scale:	**Notes:**
	In a right triangle, the two sides that form the right angle are the legs. The side opposite the right angle is the hypotenuse.  **The Pythagorean Theorem:** **In a right triangle, the sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse.** **If a and b are legs and c is the hypotenuse,** $a^2 + b^2 = c^2$.

	Example 1:  **Solution 1** $a^2 + b^2 = c^2$ $3^2 + 4^2 = c^2$ $9 + 16 = c^2$ $25 = c^2$, so $c = 5$ in Example 2:  **Solution 2** $a^2 + b^2 = c^2$ $a^2 + 12^2 = 15^2$ $a^2 = 225 - 144$ $a^2 = 81$, so $a = 9$ in.