## Unit 3 Lesson 14: Proving the Pythagorean Theorem

### 1 Notice and Wonder: Variable Version (Warm up)

#### Student Task Statement



What do you notice? What do you wonder?

### 2 Prove Pythagoras Right

#### Student Task Statement



Elena is playing with the equivalent ratios she wrote in the warm-up. She rewrites $\frac{a}{x}=\frac{c}{a} as a^{2}=xc$. Diego notices and comments, “I got $b^{2}=yc$. The $a^{2}$ and $b^{2}$ remind me of the Pythagorean Theorem.” Elena says, “The Pythagorean Theorem says that $a^{2}+b^{2}=c^{2}$. I bet we could figure out how to show that.”

1. How did Elena get from $\frac{a}{x}=\frac{c}{a} to a^{2}=xc$?
2. What equivalent ratios of side lengths did Diego use to get $b^{2}=yc$?
3. Prove $a^{2}+b^{2}=c^{2}$ in a right triangle with legs length $a$ and $b$ and hypotenuse length $c$.

### 3 An Alternate Approach

#### Student Task Statement



When Pythagoras proved his theorem he used the 2 images shown here. Can you figure out how he used these diagrams to prove $a^{2}+b^{2}=c^{2}$ in a right triangle with hypotenuse length $c$?

#### Images for Activity Synthesis

$a^{2}+b^{2}=c^{2}$





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