

KLE 2: Proving the Pythagorean Theorem

Lesson Plan/Annotated materials

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Objectives:

- SWBAT prove the Pythagorean theorem using triangle similarity

Introduction:

During a unit on similarity and trigonometry, this lesson would naturally fit in as you head into the special case of right triangles and for an introduction to the Pythagorean Theorem. The GeoGebra applet used here requires students to use a slider to separate a right triangle so they can more clearly see the proportional relationships within the Pythagorean theorem.

Computer Investigation:

To start, have each team of students go to the website: http://tedcoo.com/math/?page_id=137. Keep in mind that the overall goal of this computer-based activity is for students to prove the Pythagorean theorem using triangle similarity, which is one of the Common Core Geometry standards. Consider having the students follow the following process to help direct them along the most fruitful path of discovery of the Pythagorean Theorem:

- 1) Describe the diagram that is displayed on your screen initially. Explain what a , b , c , h , y , and x are being used to label.
- 2) Be sure to note that there are three right triangles in this diagram. Name them.
- 3) SLOWLY move the slider labeled "move slider to separate triangles" and **pay real close attention** to where each side started and where it ended. Describe where the two smaller right triangles on the left of your screen came from compared to the largest right triangle.
- 4) Adjust point A and make a conjecture about corresponding sides using the segmented lines on the right of the screen to help you.
- 5) Adjust point C and make a conjecture about corresponding sides using the segmented lines on the right of the screen to help you.
- 6) Finally, click on the "Show Proof" box and write out in sentences what each line of the proof is showing as well as why it is true to conclude each statement.

Note: Be sure to leave enough time to pull the lesson together and emphasize the major learnings that should have occurred – corresponding sides of the right triangles are proportional and can be used to develop the Pythagorean Theorem.

Frank Cox 7/25/13 2:41 PM

Comment [1]: Before you begin, be sure that you have the free program Geogebra downloaded to each computer that will be used so you won't waste time doing this when you want to start the actual lesson.

Frank Cox 7/25/13 2:32 PM

Comment [2]: For this hands-on activity you will need to have computers available to your class so you will either need use a classroom set or take your class to a computer lab. If you don't have access to these resources, another option is you would most likely want to run a demonstration on one computer and ... [1]

Frank Cox 7/25/13 2:45 PM

Comment [3]: I have found that students can either be very excited or terribly afraid of more open-ended, technology-based activities such as this. To overcome this fear, when you pair up students consider putting a mo ... [2]

Frank Cox 7/25/13 2:46 PM

Comment [4]: Along the same lines, this applet can overwhelm students. One part that some may feel afraid to even try is in explaining the theorem that is provided. It will be very important that you are circulat ... [3]

Frank Cox 7/25/13 2:39 PM

Comment [5]: This lesson will probably work best if you allow students to pair up so they can help each other solve any confusions or misunderstandings that may arise either with how to use the software or answe ... [4]

Frank Cox 7/25/13 2:44 PM

Comment [6]: The time you spend on each section of the lesson largely depends on how the students are progressing through the lesson. Keep an eye on the teams and if one seems to be getting too far ahead of be ... [5]

Frank Cox 7/25/13 2:49 PM

Comment [7]: This is a great start to class – have students observe the diagram, do a quick independent write, then whole group share out

Frank Cox 7/25/13 2:46 PM

Comment [8]: Another challenge that you should be aware of is as is the case with most activities that students can get lost in the busyness of the work and lose track of what they are to learn in terms of concepts. ... [6]

Frank Cox 7/25/13 2:39 PM

Comment [9]: To insure that there is individual student accountability, consider having students present their findings to each of the actions/questions and let others critique their thinking and explanations.