

Teaching Mathematics with Technology - An exploration with Geogebra

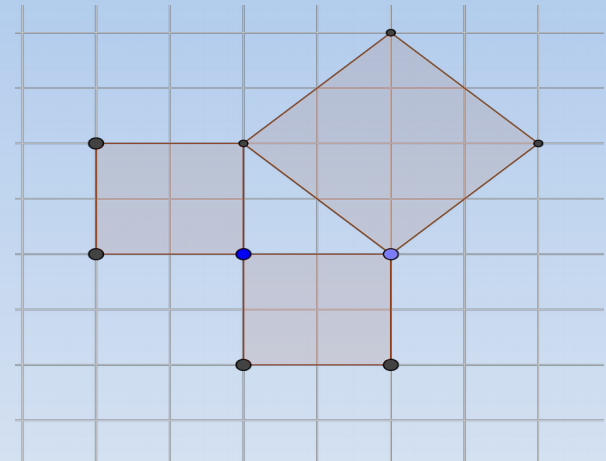
Week 4 – A lesson on Pythagoras theorem

What do we plan to do

- Explore different ways of understanding the Pythagoras theorem
- Using multiple resources to teach the concept
- Show the use of Geogebra in a visual proof
- Show the use of Geogebra for supporting a logical proof

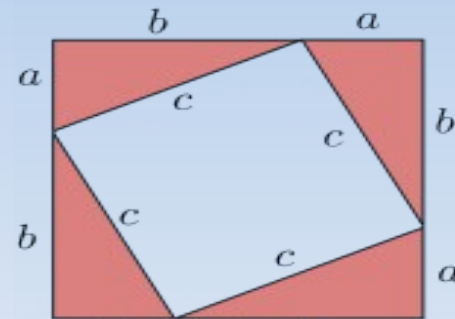
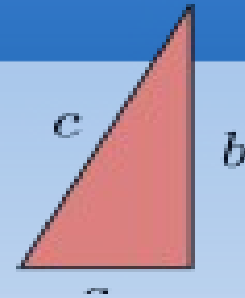
Illustration of the theorem – Activity #1

- How did the concept of squares come into this theorem?
- Visually illustrate the theorem
 - 1. Illustration with unit square.ggb



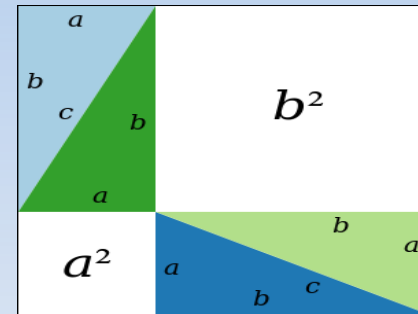
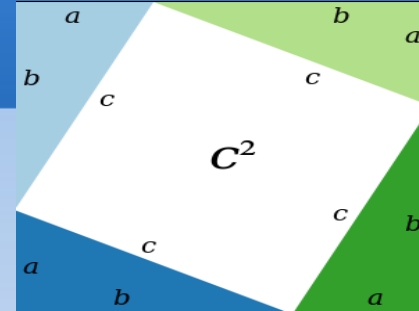
Activity #2

- As visual proofs
- Students are given paper cuttings
- mirroring these illustrations or asked to re-create



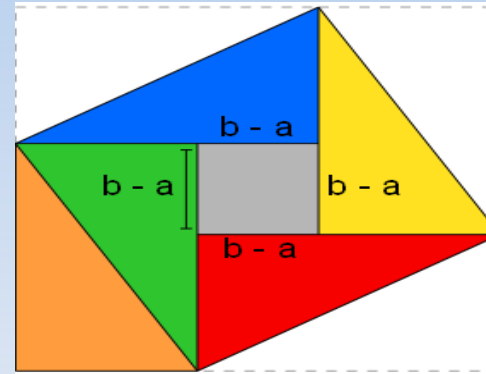
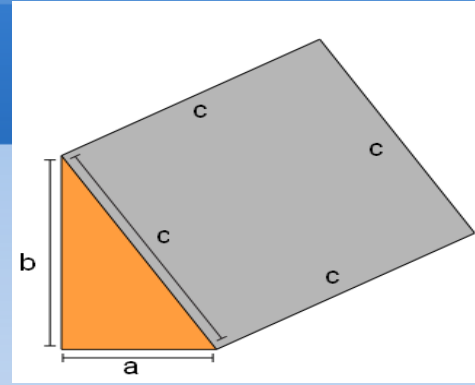
Activity #3

- As visual proofs
- Students are given paper cuttings
- mirroring these illustrations or asked to re-create



Activity #4

- As visual proofs
- Students are given paper cuttings
- mirroring these illustrations or asked to re-create



Activity #5

- Bhaskara's dissection proof
 - Visual proof
 - Square on the hypotenuse is broken up into components
 - Squares drawn on the sides
 - How is this unpacking done?
 - How is the equivalence of areas shown
 - Algebraically explained
- 2a. Bhaskara's dissection proof Showing dissection.ggb

Activity #6

- Bhaskara's proof
 - 2b. Bhaskara's dissection proof explained visually.ggb
 - 3. Bhaskara's dissection proof explained algebraically.ggb
- Logical proof of the Pythagoras theorem
 - 4. Logical proof - Step 1.ggb

Questions for deconstructing the lesson

- In which order would you use these activities? Why?
- What does the hands-on activity illustrate?
- What understanding does the digital provide?
- How do the logical and visual proof discover?
- Without the digital illustration, how easy would it be for the area visualization to built?
- How important is the calculation and finding out the values based on Pythagoras theorem?

Additional resources

- <http://jwilson.coe.uga.edu/EMT668/EMT668.Student.Folders/HeadAngela/essay1/Pythagorean.html>
- <http://jwilson.coe.uga.edu/EMT668/EMT668.Student.Folders/HeadAngela/essay1/Pythagorean.html>
- <https://www.youtube.com/watch?v=1ul8g55dYA4>
- https://www.youtube.com/watch?v=vbG_YBTiN38

What is Technological Pedagogical Content Knowledge

