GTEAMS: Pistor Middle School

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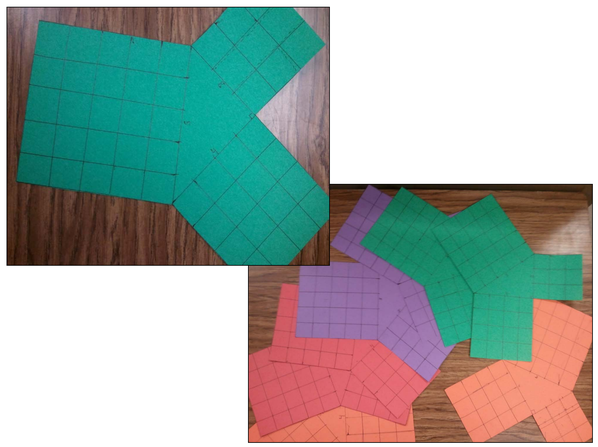
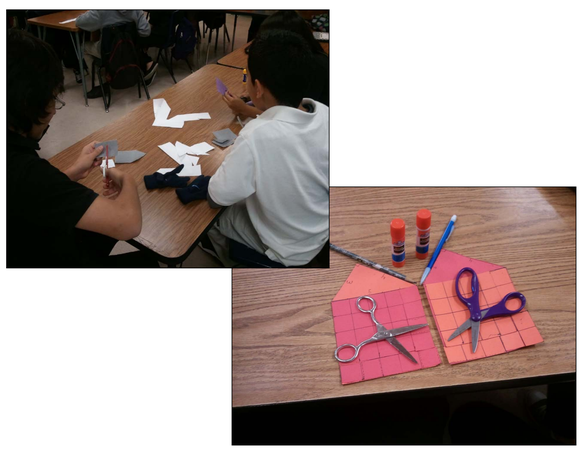
Pythagorean Theorem: Proof by Puzzle

These cutouts are a visual way to see that the square of “a” plus the square of “b” literally fit into the square of c, the hypotenuse. These were distributed to the students and the students cut out the squares from the triangle.

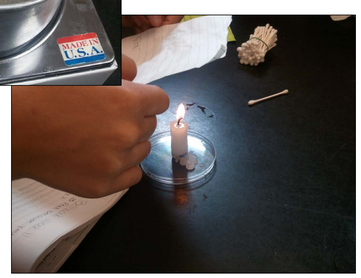




Then, the students had to figure out how to fit the smaller two (“a” and “b”) squares into the larger (“c”) square to prove the Pythagorean Theorem. Prior to this activity, the students had been drawing squares onto triangles to look like the picture above in preparation for the proof.

Building the Connections Between Science and Math

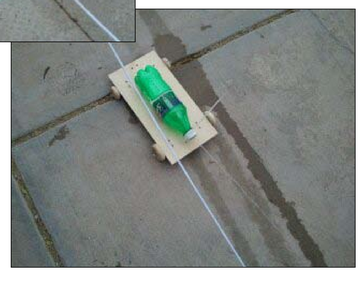
The world of math has many faces, depending on your perspective. As an engineer, Zach works with math in an experimental sense, and with the help of Liz Escarcega-Tapia and Pistor science teacher, Diana Wolf, the students were able to perform scientific experiments linking math and science.



These particular experiments involved dry ice (CO_2) and ice cubes (H_2O). The students realized that there is more to math than equations; the sum of the experiments will tell a story, and math is a tool to put the pieces together.

Experiments to Data to Equations

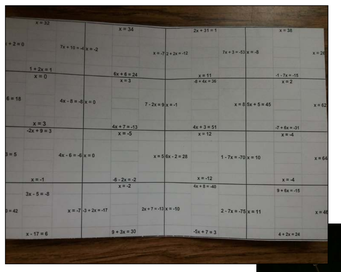
Another set of experiments that the students participated in involved repeated experiments using “Diet Coke/Mentos Rocket Cars.” The experiments were performed with various soda types, and the students had hands-on roles in the experiments, including preparing the cars for each run and measuring/gathering data afterword.

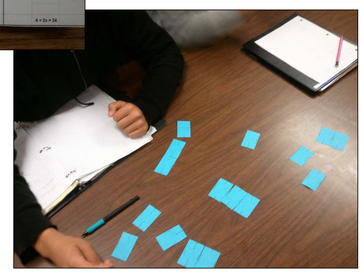


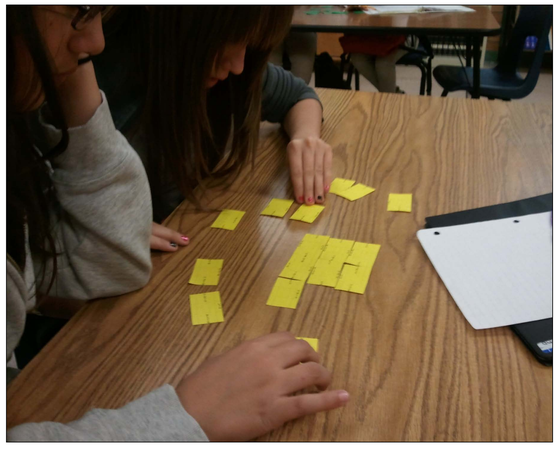
Not only were the students able to analyze their data, but they also, over the course of the experiment, came up with design improvements for the car—a great engineering lesson. This activity also led into the students’ science fair projects, and it gave some of them inspiration for their projects. The record distance for a single 20 oz. “rocket” car was Diet Coke at 8.6 meters.

Algebra Puzzles: Exploring Equations

Liz prepared an activity where the students took rectangle-shaped pieces that had either an equation or an x-value at the edge; their challenge, then, was to match the x-values with the respective equations. The students were very engaged in their project, partly because it was a good changeup from their regular class work and homework.







Another activity based on this layout is a BINGO board. For BINGO, the equation will be written on the board and the students will need to find the answer to put a marker down on their board. A BINGO activity eliminates the ability for quicker students to win every time because they may not have a board that gives the answer right away.

GTEAMS Website: http://ime.math.arizona.edu/g-teams/