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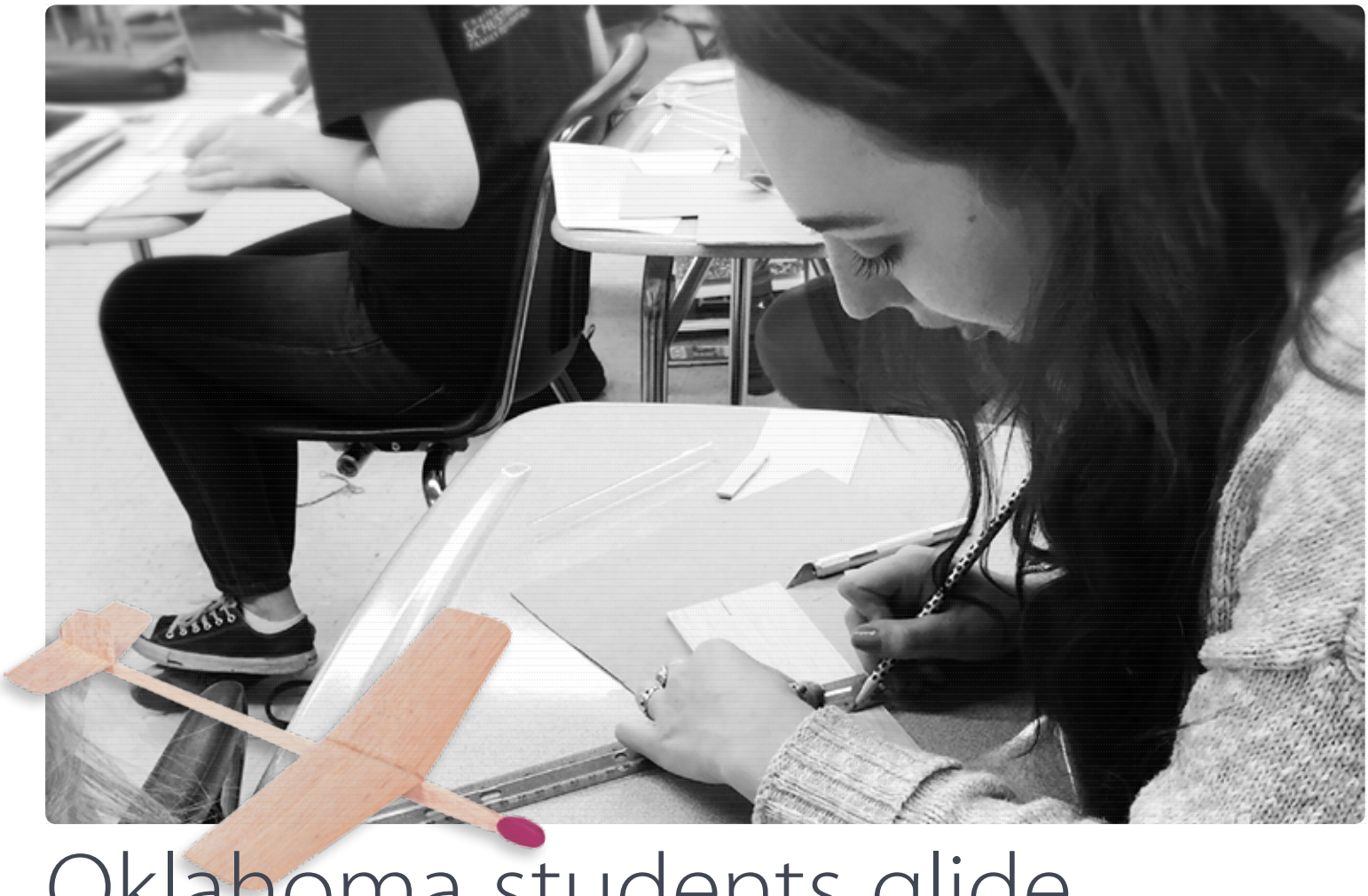

Oklahoma students glide **through geometry activity**

OEIP grant enables Tulsa teacher to implement Pitsco balsa gliders project that reinforces skills

(Editor's Note: The Oklahoma Education and Industry Partnership [formerly AEIP] and Pitsco Education join forces each year to encourage growth in science, technology, engineering, and math [STEM] learning with aerospace applications in Oklahoma classrooms. In 2014, Pitsco awarded 15 teachers $1,000 grants; in 2015, they doubled that, providing 30 teachers with $1,000 grants.)

By Priscilla Narvaez Griggs, *Geometry Teacher, Edison Preparatory High School, Tulsa, Oklahoma*

TULSA, OK – In July 2014, I received an AEIP (currently OEIP) grant for $1,000, which I used to add a glider challenge to the existing geometry curriculum at my school. I believe that the addition was a huge success!

In May 2015, after all geometry standards were covered, students conquered The Glider Project. I used the Pitsco Education grant to purchase all materials (graph paper, cardboard, balsa wood, glue, cutting knives, modeling clay, instruction manuals, and metal rulers) so that every student would be able to design a glider, construct a cardboard model, construct a balsa prototype, and conduct flight trials with both the model and the prototype. Ultimately, I had more than 160 balsa planes in my classroom, some of which were expertly designed and redesigned; many flew beyond expectation!

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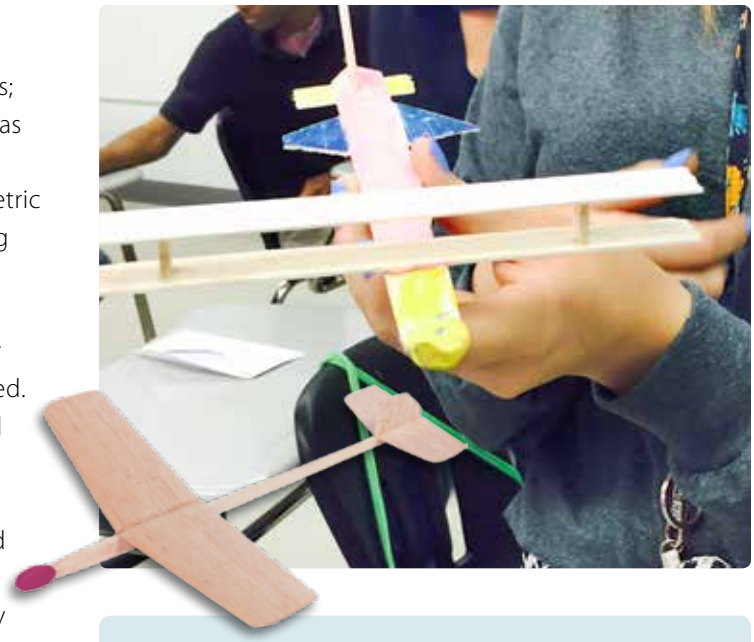
We began by watching the *Dr. Zoon Balsa Glider Video*, which introduced students to the basic instructions. Students were given time to brainstorm with a partner or group to develop design ideas; then they were instructed to design their glider – making sure it was proportional to a life-size glider – using graph paper and isometric paper. Students were also instructed to keep a journal of all geometric references, principles, concepts, and so forth that were used during the project. After design drawings were complete, students could create their designs using cardboard.

Using their cardboard gliders, students tested their ability to fly and also uncovered design flaws; then they redesigned and retested. They also critiqued each other's gliders, which really demonstrated knowledge and correct application (learning from peers is so important!). Finally, after tweaking and changing their design and construction, they were given balsa blanks so that they could build the finished product.

This project allowed students to apply the high school geometry curriculum to real-world situations, and they absolutely rose to the occasion. They showed comprehension and appreciation for the information and skills that we had learned throughout the school year. I have no doubt that my classes gained great insights from this project.

In addition to the activity, I invited two personal friends with military and engineering backgrounds, Mr. Doug Waldman and Mr. David Varner, to speak to my students about flight, design, and the application of geometry to real life. Mr. Waldman is CEO and President of Superior Linen Service, Inc., a graduate from the United States Merchant Marine Academy, and past officer in the US Naval Reserve; Mr. Varner is Chief Strategy and Development Officer at Superior Linen Service, Inc., a graduate from the United States Naval Academy and Naval War College, and a former Blue Angel pilot and naval aviator. Both speakers were captivating and exciting, and they added another facet to the activity that was rewarding and worthwhile.

I believe OEIP provides me with the most rewarding professional development of the year.



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Geometry concepts applied

Specifically, during the design process, students cited symmetry, similarity, lines, parallel and perpendicular planes (and lines), angles, congruence, and various shapes such as triangles, trapezoids, rectangles, and combinations of shapes.

When we talked about flight, we added pitch, yaw, and roll, which are concepts that related closely to our study of circles. In addition, we were able to discuss reflections, surface area, area, ratios and proportions, and the importance of geometry in flight.

In the reflections, almost all students included lines, angles, planes, and symmetry – these were the most-used concepts. Several of my higher-achieving students (who had taken physics) even discussed finding angles or measurements using trigonometry. I even had a few engineering students that focused on isometric drawings and three-dimensional figures.

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