Lesson Title: Pythagorean Theorem in Design

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Subject and grade level: Algebra Advanced 7/8 High Cap program

Link to lesson plan and materials: 
https://drive.google.com/open?id=1O576ndJmN3G7tw3IpCaAFTpo8qlx4DD7
https://drive.google.com/open?id=1KJTxTCWIh_uyzRAiowU9mz-fqvclhj3f

Lesson Description:

Students learn the value of knowing right angles in design and use the converse of the Pythagorean Theorem (if a squared + b squared = c squared then there is a right triangle) to prove their prototypes have right angles

Lesson Development:

I really wanted the value of the Pythagorean Theorem in construction to be felt by the students and understand that math is used everyday in some jobs.

Cornhole is a simple lawn game that is relative easy to construct so it seemed like a good jumping off point to get the students excited about design.

Students had lots of fun at the game night and overall it was a success!

Lesson Implementation:

Students learn what the game of cornhole is and identify the right angles within it.
Students brainstorm what makes a good lawn game (desirable level of difficult, easy to learn but hard to master, appropriate for all ages)
Students spend a week developing their prototype and updating their blueprint
Students created a Khan Academy style video blog to demonstrate their knowledge of the Pythagorean theorem (this replaced a typical quiz)
Students contributed to making a full sized class set of a cornhole variation game that students designed themselves. Students made a final blueprint on over sized paper that included a scale, evidence of the Pythagorean theorem, and multiple views of their prototype.
Students participated in a game night in which they have friends and family play their prototype game and got to play the games of their classmates in different period.

**Connection to important concepts and skills within the discipline and/or across subject areas:**
- Scale Factor for the blueprint
- Pythagorean theorem and its converse
- Measurement with a ruler
- Presentation practice
- Creation of video blogging

**Reflection:**

**What Went Well**

Students learned how to drill a screw into wood.

Students got to see the PT in action

Students had to showcase their work

**Thoughts for the Next Iteration**

Make the use of the PT more rigorous!

Make the students defend/present their work in a way that makes them reference the pythagorean theorem more.