Design A Zoo
Grade Level: 5th/6th grade GT

This is a three day lesson I introduced this fall when I taught a unit on area and perimeter concepts. Students were completely engaged and the work required for this project. As a side note, test scores at the end of the unit improved from past years so I want to incorporate this lesson next year. I want to evolve this lesson into a deeper PBL experience incorporating the arts standards and more STEM standards.
The basic idea is this...students are given a $2,000,000 budget for purchasing animals and exhibit construction for a new zoo. They are asked to manage a budget and monitor their zoo's successes and challenges. Students are given a species list, the cost of the animals, and the space required for each animal. Architectural drawings of a final zoo layout is submitted at the end.

Big Idea:

- Architectural design is a creative process and can result in fresh ideas and innovative thinking.
- Precise calculations and measurements are important in a scale drawing.
- Geometric designs can be analyzed for efficiency and aesthetics.

Objectives:

Students will be able to...

- Know the area and perimeter of polygons, regular polygons and irregular figures.
- Understand scale and solve problems involving scale drawings.
- Solve real-world math problems.
- Draw geometric shapes using mathematical tools such as a ruler, protractor and technology.

Essential Questions:

- Why do zoos matter?
- What steps are involved in designing a zoo?
- What kind of tools does a zoo designer need in order to make an architectural plan for a zoo?
- How can geometry be applied to designing a zoo?
- How do you analyze a zoo budget for efficiency while maintaining the health of zoo animals?

At the end of this project, students submitted a map of their zoo on large chart paper with their mathematical calculations as evidence of their understanding. Some of the maps were carefully drawn while others were quickly put together with little attention to details. I know offering different multimedia choices would deepen the meaning making and understanding. I'm considering using Google SketchUp or TinkerCad to aid those students in the map making process and give them the ability to create an artist's rendering of their zoo. I would like to incorporate NCAS **Anchor Standard 4: Select, analyze and interpret artistic work for presentation** to enhance this project as well. In addition to the map making, students can create an interactive presentation next to the habitat of one of the zoo animals they chose using an online platform such as Prezi or WeVideo to educate the public about the animals in the habitat. Students add photos, video, music, text, etc. in a creative, artsy and interesting way.