Name: Date: Period:

Module: Engineering Design	Unit: Predictive Analytics - POM	EXPLAIN

Design and Build: EDP Challenge

Learning Target:
I can understand the Engineering Design Process and apply that process to an Engineering design and build challenge.

Instructions:
Work through the different stages of this Design and Build Challenge. Remember to apply the EDP throughout the process of the activity. Be ready, the investors may ask to change or add to the initial 'slender tower' design requirement.

Engineering Design Process (EDP)

Essential task: You are working together with your team to design and build the 'most slender' tower made out of no more than 10 sheets of "regular" printer paper and 1m length of "regular gift wrap" transparent tape.



Engage (+1)	Response
Watch this video on the engineering challenges to the Shanghai Tower. Dream Big - Shanghai Tower	1. What problems are the engineers solving (hint there is way more than just 1)? 2. What were some of the solutions to those problems? 3. What were some of their constraints? 4. What are some of the analysis techniques?



Explore (+1)	Response
Challenge: Using only 10 sheets of regular printer or loose-leaf paper and only 1m length of transparent "gift wrap" tape, design, and build the tallest freestanding 'slender tower' with the smallest possible footprint. The definition of slender will be calculated	1. What are your *criteria*? 2. What are your *constraints*? 3. What are a couple of *risks* and *benefits* of the design?

	using the ratio of the total height divided by the widest measured part of the base. Remember that the tower must stand at least ½ as tall as you are and it must freestand for a minimum of 10s without being secured nor taped on the ground. The recorded video should clearly show primary proof that the tower is freestanding. Slender Tower Challenge	4. What are some challenges you foresee to this design and build? 5. What additional resources have you found to support your initial plan (hint: is the top of a concrete building considered the max height of the tower?). RECORD: Max Height: Max Width: Slender Ratio:

	Explain (+6)	Link
	Use the EDP - Design Guide - Graphic Organizer to organize your teams ideas and develop a plan. Draw the blueprints of your initial tower design and be ready to 'defend' your ideas.	Essential Hyperlink or upload your 1) completed design guide and 2) blueprints as a picture..

	Elaborate (+10)	Link
	Phase 1 Use the EDP to build Create, Test and Improve your product. Measure the maximum height and the widest width and calculate the width to height ratio. The secretary of your group should take pictures to document the build, testing and improvements phases. --- ~~Phase 2~~ ~~A new design requirement was just handed down from the investors! They now want to have the most slender tower freestanding tower but now able to withstand the winds of a small 6" deskfan blowing at full power from a distance of 1m away of your tower.~~ ~~Use the EDP - Design Guide - Graphic Organizer to organize your teams ideas and develop a NEW plan to implement the new design requirement.~~	Phase 1 How do we calculate the width-to-height ratio? Hyperlink of upload photos of your build and testing and improvement phases... Up the 10s video of your tower fee-standing --- ~~Phase 2~~ ~~Hyperlink or upload your 1) completed design guide and 2) blueprints as a picture..~~

	Evaluate and Reflect (+2)	Response
✓	Reflect back on your experience as a team (or individual) as you went through this process and answer the following reflection questions.	1. Citing evidence from your experience, what was the easiest stage of this EDP design challenge (Ask, Research, Imagine/Brainstorm, Plan, Create, Test, or Improve). Explain? 2. Citing evidence from your experience, what was the most challenging stage? 3. If you were to make 1 additional improvement to your design-build what would be that improvement? 4. When the investors required a new design requirement, how did that change your original plan? 5. When looking into the future of technology we are always looking for the "next best thing" to help imprve the lives of humans, what would be one future technology that would be beneficial to society in 5-10 years?