Coventry High School
Applied Learning Task: Teacher Facing Prompt [STUDENT]

Department: Mathematics
Title: **Thrill Ride or Scenic Escape?**
Designers: Val Muschiano
Grade Level: 11 & 12 Course: Trigonometry
VoG Stems: CT1, CT2, CT3, CT4

I. **Curriculum Unit and Essential Question**: (Provide a statement of the essence of this assessment: What unit is assessed? What essential question is addressed?)

Unit: - Linear and Angular Velocities
Essential Question - *How does a change in the radius of an amusement park ride influence the adrenaline you experience?*

II. **Timing and Pacing**: (Where and when in the unit will this assessment be placed?)

Unit covered at the end of Quarter 1 after covering linear and angular velocity. With the physical outdoor part, the research component, and the create part, the ALT will take 2 class periods.

III. **Standards Assessed**
Note: The fewer the standards/objectives, the more focused the instrument and resulting data

Common Core Standards (Provide name, number, and brief descriptor.)
CCSS.MATH.CONTENT.HSG.MG.A.3 - Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).*
CCSS.MATH.CONTENT.HSG.CCSS.MATH.CONTENT.HSG.C.B.5C.B.5 - Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector
NGSS - **HS-ETS1-2.** Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. (Grades 9 - 12)
NGSS HS-PS2-1. Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution **that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.** [Clarification Statement: Examples of data could include tables or graphs of position or velocity as a function of time for objects subject to a net unbalanced force, such as a falling object, an object sliding down a ramp, or a moving object being pulled by a constant force.] [*Assessment Boundary: Assessment is limited to one-dimensional motion and to macroscopic objects moving at non-relativistic speeds.*]

Grade Span Expectations (Provide name, number, and brief descriptor.)
N/A
Content Standards (Provide name, number, and brief descriptor.)
N/A

IV. **CHS Vision of the Graduate Alignment**: (Please connect at least one Vision of the Graduate Rubric indicator and describe how students will meet the criteria)

Vision of the Graduate Standards (Provide the specific VOG stem reference)
In rubric: CT 1 - **Solve the problem. Make** multiple attempts until an effective solution is reached by **applying, evaluating,** and **adjusting** strategies and approaches. **CT2 -** Analyze outcomes and reflect on results **CT4 -** Support claims with evidence and reasoning CT 3 - **Evaluate** outcomes and **reflect** on the implications of results
Not evaluated: (Need to be?) . ~~RI2 - **Facilitate** small and large group interactions. **Build** on others' ideas, support others, and/or help the group reach consensus while expressing her/his ideas.~~

V. **Context** (Where in the learning "continuum" does the task occur? How will you get students excited about the task?)

The task is a physical application of linear and angular velocities. Students are able to model a scenic amusement park ride and an adrenaline filled amusement park ride.

VI. **Hook** (How will you hook and engage students' interest and enthusiasm through thought-provoking experiences throughout the task?)UbD

Students will join the thrill ride or scenic escape group. Based on their experiences, they will try to model the speed of a ride using a ride and running in a circle. By calculating the speed of the runner, the students are able to compare their guess to an actual amusement park ride. We will then watch the actual Colossus and Insanity amusement park rides and compare their findings to the actual rides.

VII. **Supporting Question(s)** (Questions that contribute knowledge and insights into the applied learning task and help to scaffold the essential question)IDM

How fast do you think an actual amusement park ride travels? Researching the rides will allow a basis for the student created rides. What speed restrictions do you think we should set on a ride according to the data?

VIII. **Featured Resources** (generate students' curiosity and interest in the topic, build students' content knowledge, and help students construct and support their arguments related to an essential question) IDM (develop student facing prompt in this section)

Student prompt, physical activity outdoors modeling the ride, videos of Colossus and Insanity, research and creation of their own ride.

IX. **Reflection/Feedback/Revision Components** (Describe specifically how the students will reflect on how this work connects to the VOG)

Students compare their created ride to the data to see whether their creation is reasonable and revise accordingly. Students reflect on their ride and compare it to a given ride to provide similarity and differences. Students consider safety factors required for their ride to be a viable option.

X. **Presentation** (consider audience)

Students share their created rides within the class and look for warm and cool feedback prior to final submission.

XI. **Product** (review the CREaTe framework to examine product authenticity and higher order thinking)

- ✓ Learning Is integrated across subject areas integrating physics
- ✓ Student choice for task **AND** Task differentiation by content, process, and/or product (such as addressing learning preferences, interests,or ability levels).
- ✓ Student-generated questions/ projects with content/standard at ANALYZE level (Differentiation; Organizing; Attributing), EVALUATE(Checking; Critiquing), or CREATE level (Generating; Planning;Producing)

Applied Learning Task	
Taking Informed Action	**Understand: The calculations involved in producing an amusement park ride.** **Assess: Through investigation and active participation students are able to determine the viability of a ride.** **Action: Students create, analyze, revise, and assess the safety issues involved in amusement park ride creation.**

Coventry High School Applied Learning Task Rubric		
Not Yet What's Missing?	**Meets Criteria** *Color this box green if you have met the standard.*	**Quality Task How did it go beyond?**
	The task connects to curriculum and standards taught within the course.	
	The task connects to at least one part of the Vision of the Graduate. ❏ reflective learner ❏ critical thinking ❏ effective communicator ❏ responsible individual	

	❏ global citizen	
	The task requires students to apply content and skills to an authentic real world task/ topic.	
	The task requires higher order thinking skills and creativity.	
	Students have choice in the topic, process, plan, or final product.	
	Students have the opportunity to reflect and revise the task.	
	Students present the task to an audience.	

Student Facing Prompt
Thrill Ride or Scenic Escape? **You may use the template link or attach your own student facing prompt**

Reflecting on Current ALT
Think about the task in its current iteration. 1. Introduction to the ALT 2. Student prompt 3. Rubric Come to consensus to complete the rubric. 1. Explain why it falls into 'Not Yet' or 'Quality Task' Columns. 2. If it meets the criteria, shade the box a different color. Links to documents: