Course: Physics Name:_____Date:_____Period:_____
Unit: Roller Coaster Physics
Project: Roller Coaster

GOAL: Students will describe and measure the physics behind an amusement park ride. Using data acquired from the 6 Flags field trip or from video footage, students will calculate physics properties related to the ride.

ROLE: Amusement Park Safety Operator

AUDIENCE: Amusement Park CEO

SITUATION:

Scenario

You are a Safety Operator for an Amusement Park. Your job is to understand all of the physics behind the rides at the park to help you determine if they are safe or not. You will pick one ride and measure and describe physics of the ride. You can focus on Energy Conservation, Circular Motion, Momentum, Kinematics or Free Fall Acceleration.

Performance: After completing this problem, students will be able apply one of the these standards to a ride:

P.D.19 I can solve problems using kinematics concepts.
P.D.21 I can solve problems for objects experiencing projectile motion with constant x-direction velocity and constant y-direction acceleration
P.F.35 I can solve problems using Newton's 2nd Law (Fnet = ma)
P.E.45 I can use the conservation of energy to solve problems.
P.E.48 I can calculate the momentum of and the impulse on an object (or system) with direction and proper units
P.C.57 I can calculate the magnitude and direction of the acceleration for a particle experiencing uniform circular motion.
P.C.58 I can use Newton's 2nd Law to solve problems for a particle experiencing uniform circular motio

P.G.67 I can convert units within the metric system of measurement and between the metric and English systems of measurement.

Product:

Students will create individual whiteboard screencasts using www.screencast-o-matic.com to present their findings. See rubric on the back of this page for specific screencast video requirements.

Whiteboard Screencast videos are due **Friday April 27, 2012** by the end of the school day.

Screen-cast Procedure:

To present your whiteboard you will create a 'screen-cast' video that displays a photo of your whiteboard while you explain your problem solving method and solution. You will create your screen-cast using the following website: http://www.screencast-o-matic.com/.

Step 1 - go to http://www.screencast-o-matic.com/ **Step 2** - watch the short video titled 'A very quick demo', this video will show you how to create and save your screen-cast**. Step 3** - After practicing, record your screen-cast and save it to your computer. Save your video as 'First Last Name Period Barbie' -include a space between your first and last names. **Step 4** - Upload your video into your E.L. Haynes Google Docs. In your ELH email, click on documents, then upload, then files. Select your video and click, start upload in the dialogue box that appears (leave both boxes checked within the dialogue box). **Step 5** - After uploading your video (it may take a few minutes before it available for view) share it your physics teacher.

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For additional help, see the instructional video on your physics class website.

	Exceeds the Standard - 4	**Meets the Standard - 3**	**Approaches the Standard - 2**	**Does not meet - 1**
Whiteboard (Standard WHA.1) 1	•Includes all '**3'** items and •Organization of whiteboard improves aids & improves explanation	•Includes: Standard Analyzed, Data Table (at least 3 trials), Unit Conversion, Labeled Diagram, Appropriate Calculations •Writing is neat & easy to read	• missing 1 of items listed above •Writing is neat & easy to read	• missing 2 or more items listed above
Video (Standard WHA.1) 1	•Includes all '**3'** items and •Quality & clarity of video demonstrates high level of effort and/or practice prior to recording	•Video length ≤ 5 minuets •Appropriate volume level •All whiteboard items explained •Showing of video clip of ride	•Video length ≤ 5 minuets •Acceptable volume level •1 item (whiteboard, ride video) is not explained/missing	•**Video length ≥ 5 minuets** •Volume level is too loud or too much background noise to be heard clearly •1 item (whiteboard, ride video) is not explained/missing
Physics Principle (Standard P.D.19) (Standard P.D.21) (Standard P.F.35) (Standard P.E.45) (Standard P.E.48) (Standard P.C.57) (Standard P.C.58) 6	•Includes all '**3'** items and •solution includes all **correct** units •Supporting details and/or examples that increase the viewer's ability to understand the video	Includes: • What the problem is asking for (with correct units) • What is known • Description of each variable • How/why the chosen formula used • How values were substituted	Missing an item from '**3'** that makes it unclear if the *physics* of the problem is understood	Missing multiple items from '**3'** that makes it clear that the *physics* of the problem is **not** understood
Unit Conversion Explanation (Standard P.G.67) 2	Includes all '**3'** items and student explains the reason for the proper unit conversions	•All values have ***logical*** units •All necessary unit conversions are correct	•Missing an item from 3 that makes it unclear that student understands unit conversions	Missing 2 items from 3 that makes it unclear that student understands unit conversions