Name: _____

PHYSICS GREAT AMERICA TRIP
RAW DATA SHEET (Rev 5/2013)

• Each student will record raw data measurements taken at the park on this page. When preparing the formal lab report, include this page for each student. USE BALL POINT PEN and remember to THINK METRIC!

• **RESEARCH (5 points):** Use www.sixflags.com. Choose from 10 thrill rides (see other side).

Name of ride:			
Max Velocity (m/s):			
Track length (m):			
Max height (m):			
Total time of ride (s):			

• **DATA MEASUREMENTS:** At the park, each person in your group will collect the following data for each of the 2 rides. Be sure to include each person's raw data sheet with your lab report.

RIDE 1: _____ RIDE 2: _____

a. Total # of passengers on fully-loaded train:
b. Total # of cars on each train:
c. Time the total ride:

d. All group members independently determine height of the first hill (show sample calculation).

	Ride 1	Ride 2	Calculations
Eye height (e) (m)			
Angle 1 (θ_1)			
Angle 2 (θ_2)			
Distance (b) (m)			

• **RIDE ANALYSIS (11 points each ride):** For each ride, place smooth data table and questions on a separate, clean sheet of paper. Think metric (MKS)!

Data collation: Raw data for all group members is to be placed in a smooth table for each ride. Average the values for ride time and height and use to answer the following questions.

Questions: As a group, answer the following questions for each ride. Show all calculations.

1. Compare total ride time to the advertised values (error). Comment on discrepancies.
2. Compare height of tallest hill to advertised value (error). Comment on discrepancies.
3. Which hill on each ride is the highest and why?
4. Calculate the work needed to bring a fully-loaded train to the top of the first hill.
5. Calculate max velocity on the ride. Where does this occur? Compare to advertised value (error).
6. Calculate the ride's average velocity. How does it compare to the maximum velocity? Why the difference?
7. Discuss features of the selected ride which make it unique compared to other park rides.

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GREAT AMERICA PHYSICS SCAVENGER HUNT!!!

Determine the following numbers (round to nearest whole #) and add them to find the final answer. Worth 10 points.

1. **# of times upside-down on Batman**..... _____
2. **# of flag poles around the reflection pool**..... _____
3. **# of riders per car on Demon (when full)**..... _____
4. **# of mammalian horses on lower level of Columbia Carousel**..... _____
5. **# of riders on American Eagle (when full)**..... _____
6. **max height in centimeters (not inches) to ride Vertical Velocity**..... _____
7. **# of restaurants in the County Fair Food Court**..... _____
8. **last 2 digits of year on Cochrane Building in Hometown Square**..... _____
9. **# of revolutions per minute of Condor center hub**..... _____
10. **# of cups on Chubasco**..... _____
11. **# of cars per train on Viper**..... _____
12. **Closing time of park on day of our visit (to nearest hour)**..... _____

TOTAL: _____

MASSES OF VARIOUS RIDES

- Mass of one person = 65 kg
- Mass of individual cars: (without passengers)

American Eagle: 1050 kg
Batman: 485 kg
Demon: 725 kg
Raging Bull: 1225 kg
Ragin' Cajun: 500 kg (?)
Superman: 500 kg (?)
Dark Knight: 500 kg (?)
Viper: 1050 kg
V2: 500 kg (?)
X Flight: 500 kg (?)

LAB REPORT REQUIREMENT

- One report per group, worth 45 points, due Friday May 10.
- Groups to consist of 3-4 students.
- All measurements/calculations to be in metric units.
- Full group lab report, typed on unlined paper (calculations may be handwritten):
  - → Cover page with student/hour and teacher names (2 points)
  - → Purpose and procedure (2 points)
  - → Research of rides (5 points)
  - → Raw data sheet for each student (5 point penalty if not included)
  - → Scavenger hunt tabulated (10 points)
  - → Clean page for each ride (11 points each) with data table summarizing all students' data, and answers to questions showing calculations where necessary
  - → Group conclusion and summary (4 points)