

Six Flags Physics Challenge

CHALLENGE

Use activities at Six Flags to teach either a physics concept in a simple way or solve a problem.

CONCEPT TOPICS

(Only one concept per student in a group – first come, first served)

Relative motion	Conservation of momentum
Newton's First Law – in motion	Centripetal force
Newton's First Law – at rest	Rotational inertia
Newton's Second Law	Angular momentum
Newton's Third Law	Simple harmonic motion – pendulums
Friction	Simple harmonic motion - springs
Work	Bernoulli's principle
Conservation of energy	Sound 1
Power	Sound 2
Momentum	Doppler Effect

CONCEPT VIDEO (One per student)

1. Choose one concept from the topics covered this year in physics and create a three to four minute video from the Six Flags park to explain and illustrate your concept. Keep it simple, don't go too in depth.
2. Video Guidelines:
 - Not more than 60 second explanation of your concept UNLESS your explanation is a voiceover for your activities
 - At least 120 non-boring seconds of amusement park activities that illustrate your concept
3. One concept per student. You may work together in groups, but you need to have as many concept videos as you have people in your group. Every student is "in charge" of their own concept.
4. Submit video to your Physics Shared folder with this assignment title Six Flags Video

SOLVE A PROBLEM (One per ONE/TWO students)

1. Solve a problem applicable to one of the topics above using measurements & calculations
2. Set up your problem "report" like an ordinary lab report (brief), with a header and a brief description of your objective and problem. (Your problem does not have to be related to your concept.)
3. Include at least two "lab photos" of you gathering data (if that's how you got your data)
4. Put your data/measurements in Data Table
 - Use an app like Physphox or The Physics Toolbox to gather data
 - Include a graph of your data if applicable (if that's how you got your data)
5. Show calculations
6. Submit PDF to your Physics Shared folder with this assignment title Six Flags Problem
7. *Ideas for Problems*
 - Search "Smartphone Physics Experiments"
 - [The SmartPhone Physics Challenge](#)

Six Flags Physics Challenge RUBRIC

Rubric Guidelines	Not interesting or clearly presented	Somewhat interesting and clearly presented	Creative and clever presentation
	Up to 25% of possible points	26% - 70% of possible points	71% - 100% of possible points

Video	60 s explanation	120 s additional video illustrating concept	Concept defined	Concept explained	Concepts expanded	Total Points
	10	15	10	10	5	

Problem	Objective	Description	2 Lab photos	Data in Table	Graph	Calculations	Total Points
	5	5	10	10	(10)	20 (10)	