

California State University, Northridge
Summer Academic Enrichment Program

Rockets and Roller Coasters

Course Overview:

Rockets and Roller Coasters brings science knowledge and exciting hands-on engineering together. Students will apply several physics concepts by designing and constructing their own structures (model water powered rockets and card stock roller coasters), calculating data and other activities.

Course Description:

Want to know what it takes to be a rocket scientist or a roller coaster engineer? During this class, students will discover engineering challenges while building their own rockets and rollercoasters. This class will help students learn about scientific problem solving and the exploration of several science themes. It is designed to be a hands-on learning experience that challenges students to solve problems and think critically and creatively. What more can you ask for while learning about the physics of flight, forces and motion?

Course Goals and Objectives

1. Goal: Roller Coaster Design and Building

Objective: Investigate science concepts that involve roller coasters such as: speed, acceleration, gravity, friction and kinetic/potential energy

Objective: Analyze data to calculate average speed and acceleration, graphing results, determine how slope effects speed and acceleration

Objective: Investigate and build a successful roller coaster that demonstrates all parts of acceleration

2. Goal: Water Powered Rocket Design and Building

Objective: Investigate science concepts that involve model rockets such as: Newtonian physics, flight, thrust, speed, velocity, acceleration and stability.

Objective: Analyze data that will allow students to determine speed of the rocket, distance the rocket travels, and hang-time of the rocket.

Objective: Investigate build and test a rocket that will be launched closest to a target. (Team competition.)

Course Materials:

Students are expected to bring the following to class on a daily basis:

1. One notebook (composition or spiral)
2. Writing utensils (red pen, pencil, blue/black pen).
3. Ruler (metric recommended).
4. Calculator (non-graphing).
5. Spirit of teamwork and competition.

Course Grading

Student work will be evaluated based on the following criteria:

- Completion of written work as shown in lab journal.
- Quality of lab performance as demonstrated in class.
- Contributions to the class environment evident in participation and cooperation.

A letter grade will be assigned upon the completion of the course.

Academic Integrity

Plagiarism:

Plagiarism: “1. the unauthorized use or close imitation of the language and thoughts of another author and the representation of them as one's own original work.”

(“Plagiarism.” Dictionary.com Unabridged (v 1.1). Random House, Inc. 20 Feb. 2009.

<Dictionary.com <http://dictionary.reference.com/browse/Plagiarism>>.)

Access to technology makes it easier to copy the work of others. Students will learn what constitutes plagiarism and how to steer clear of it. As a rule, if there are three words in a row that someone else can claim, cite it. Plagiarism is stealing and cheating and will not be tolerated. Plagiarism is against the law.

The first time a student is caught plagiarizing, there will be a teacher/student conference, a phone call home, no credit given for the assignment, and notification given to the SAEP office.

Copying from a fellow classmate is also unacceptable on homework assignments and individual assessments. The consequences are the same as above.

Teacherease.com:

Parents and students can access grades and attendance through a web-based grade program at teacherease.com. By the end of the first week, parents will be emailed the password to access the program. If you do not receive your password via email, please contact the office staff at saep@csun.edu and request the password to be re-sent. It is beneficial for you to refer often to the website to check your child's progress and attendance in class. If you have any questions, please feel free to email me.

Classroom Behavior:

The student is expected to demonstrate mature, polite behavior and extend courtesy to everyone at all times:

1. Actively participate, and respectful verbal and nonverbal interaction with all opinions must be shown at all times.
2. Since differing views will be expressed, the teacher and the student(s) will mutually maintain a safe environment for courteous dialogue.
3. Respect is to be shown for all CSUN property.
4. No food or beverages will be permitted in the classroom. Snacks must be eaten outside between the designated breaks.
5. Warnings for behavior / discipline problems will be given once. Any further problems will result in a phone call to the parent(s) or guardian(s) and possible dismissal from the program.

SAEP Electronics Policy

Cell phones, music players and headphones are not permitted to be used during class hours.

- a. Please put your cell phone on silent (NOT vibrate).
- b. No texting is allowed during class.

You will be given one verbal warning if the above is not followed. Should a second warning be necessary, your cell phone, music player and/or headphones will be confiscated and held by the teacher until after class. If a third time occurs, your cell phone, music player and/or headphones will be confiscated and held in the SAEP office and **MUST BE PICKED UP BY A PARENT.**

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After reading through the syllabus, please sign and date and have your student return it to class. The signature constitutes your commitment to the class as we partner to make the next five weeks a life-long educational experience for your student.

## **Student/ Parent Agreement:**

Please bring this signed and dated **Rockets and Roller Coasters** syllabus agreement to class tomorrow.

If you do not understand any portion of this syllabus, or if you have any questions regarding this class, please do not hesitate to email the teacher.

We have read and understand the contents of this syllabus.

Student name \_\_\_\_\_

Student signature \_\_\_\_\_

Date \_\_\_\_\_

Parent/Guardian name \_\_\_\_\_

Parent/Guardian signature \_\_\_\_\_

Date \_\_\_\_\_

Phone \_\_\_\_\_

E-mail \_\_\_\_\_