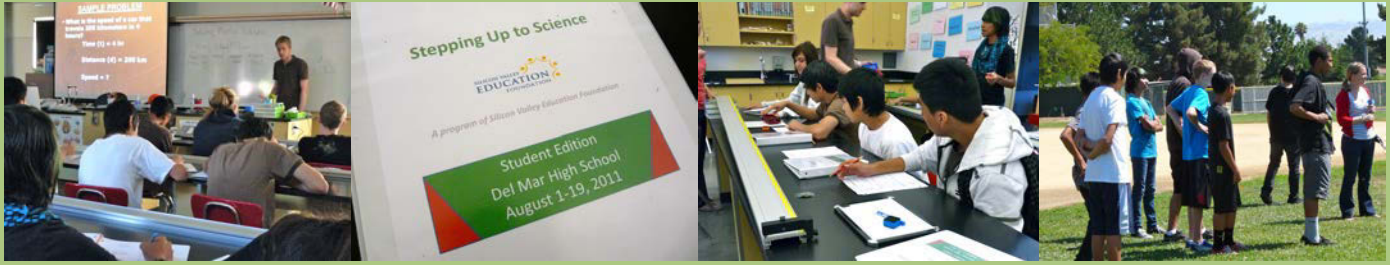


# Stepping Up to Science



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## Students “Hang In” Stepping Up to Science



Students learned about the physics of “hang time” and calculated their own hang time in an activity during last Friday’s class. Hang

time is the length of time a basketball player appears to defy the law of gravity by seemingly hanging in the air on the way to dunking a basketball. “How long do you think you can hang in the air? How long do you think Michael Jordan can hang?” physics teacher Brian Ellis asked the class. Mr. Ellis showed students how to calculate their own personal hang times by measuring how high they can jump. The experiment, conducted in the breezeway outside the classroom, was good exercise for brain and body alike. Students learned the relationship between distance, time, and the force of gravity.

How long can Michael Jordan “hang”? Turns out, just under one second. The best hang times recorded in the Stepping Up to Science class were a little over a half second. The best “hang time” on planet earth belongs to the puma, which can jump four meters and hang in the air for—two seconds! Calculate it

yourself—or have your student show you how (here’s a hint: start with the formula for distance jumped,  $d=1/2gt^2$ ).

## Khan Academy: Another Window to Learning



Another technological resource was Khan Academy, a free online learning site with a library of over 2,400 videos covering everything from physics to arithmetic.

If you have Internet access at home, we encourage you to work with your student to use the site as another opportunity for learning the subject matter. Visit Khan Academy at [www.khanacademy.org](http://www.khanacademy.org).

## Invest in Public Education

Silicon Valley Education Foundation focuses on raising student performance in the critical areas of math and science. To learn more about SVEF, our educational programs and how you can help support public education, visit [www.svefoundation.org](http://www.svefoundation.org).

## Teaching Algebra Benefits Physics



At the beginning of each class, students did algebra warm-ups instead of jumping jacks. But the activity really got the blood flowing nevertheless. According to algebra teacher Anne Hefflinger, students passing Stepping Up to Science this summer become eligible to take Geometry in the fall. “We’ve covered everything I wanted to cover,” Ms. Hefflinger said after class on Friday. Students have learned perfect squares up to 400 (and square roots), linear and polynomial equations, factoring, and graphing—lots of graphing. Learning equations and the graphs side-by-side with physics helps the students understand the concepts of distance, velocity, and acceleration. And it helps the teachers, too. “I normally have to spend quite a bit of time in my

physics class teaching math,” said Mr. Ellis. “Now I don’t have to. I can see what the students are learning.”

“The Stepping Up to Science class ensures that students get the math they need to use for physics, when they need it,” said Ms. Hefflinger. Stepping Up to Science puts students on track to complete the "A-G" coursework necessary to attend the University of California (UC) or California State University (CSU) systems. A recent Santa Clara study showed that only half of all students in Santa Clara County graduate with enough math and science credits to qualify for admission to UC and CSU schools.

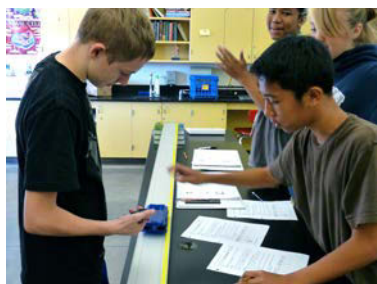
In addition to the daily algebra warmups, exit quizzes, and daily lessons in physics, Mr. Ellis and Ms. Hefflinger used lots of technology in the classroom. Mr. Ellis used motion detectors and SparkVue software to translate students’ movements toward and away from the motion detectors into graphs. Physically moving their bodies helped students understand the concepts of distance over time (speed) and changes in speed (acceleration).

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## Stepping Up to Science Graduation a Steppingstone to Success

14 day program for students comes at a good time

Scheduled in August, the class offered a refresher in math and prepares students for success in Del Mar High’s innovative ninth grade physics program. Most high schools only teach physics in the twelfth grade, even though many of the tools students learn to use in Algebra apply to physics.



Stepping Up to Science students also spent time learning the scientific method. This involved learning how to design and control an experiment, and the types of variables used in experiments. The use of variables in physics experiments dovetails with what they learn in algebra. This enables students to understand that the variables they use in their algebra equations are the same ones they measure in their physics experiments.

## The Pathway to College Starts with Meeting A-G Requirements

Research shows that going to college enriches lives, offers more employment opportunities and leads to higher salaries. Students who plan to attend a University of California or California State University need to take certain high school classes. Find out what classes you need to take, when you need to take them and other helpful information on our website. Visit Silicon Valley Education Foundation at [www.svefoundation.org/a-g](http://www.svefoundation.org/a-g).