



US DEPT. OF EDUCATION  
BLUE RIBBON SCHOOL



PRESIDENTIAL AWARDS FOR EXCELLENCE IN  
MATHEMATICS AND SCIENCE TEACHING



CALIFORNIA DISTINGUISHED  
SCHOOL

# RIO AMERICANO HIGH SCHOOL PHYSICS

## THE PROGRAM

All high school students planning a baccalaureate education should take one year of biology, one year of chemistry, and one year of physics. Students electing physics are introduced to the subject matter at many levels through a variety of activities. Nearly all of the curriculum materials used in the physics and AP Physics courses have been developed by the teacher specifically for students at Rio. Students investigate topics through hands-on laboratory activities (many involving the use of computers and various sensors), directed discussions, demonstrations, video presentations, readings, and homework assignments.

## PHYSICS 1 AND AP PHYSICS 2

Physics 1 is intended to provide any college-bound student with an introduction to physics. Math used in the course is maintained at the Algebra 1 level. Topics include force and motion, circular motion and gravity, conservation of momentum and energy, heat and temperature, electricity and magnetism, waves, light, and wave optics. The content in Physics 1 is aligned to the State of California Academic Content Standards in High School Physics. Rio students have demonstrated outstanding performance on the STAR test in physics (Physics CST).

AP Physics 2 expands on some of the topics in Physics 1 and introduces some new ones. All material is given a more sophisticated mathematical treatment, at the Pre-Calculus level. Topics include advanced kinematics, advanced statics and dynamics, harmonic motion and resonance, rotation, thermodynamics, fluids, advanced electromagnetism, ray optics, and modern physics.

The **combination** of Physics 1 and AP Physics 2 prepares students for the College Board's Advanced Placement Physics B Exam administered each year in May. Rio students have always done well on the AP exam. For the past twenty years, Rio's AP Physics pass rate has been well over 90%.

AP Physics students have earned national honors several times in the American Association of Physics Teachers' Physics Bowl competition exam. Our students have earned medals in the Science Olympiad Physics Lab event at the state and national levels. Former student, Jason Kamras, was named as National Teacher of the Year. Susan Crown was a Merrill Scholar at Cornell. Both Susan and Jason cited their AP Physics experience as highly influential in their subsequent success.

## PREREQUISITES

Physics 1 is a first-year course. AP Physics 2 is a second-year course. The two courses are highly integrated and together prepare a student for the AP Physics B Exam.

### PHYSICS 1

Any student who has completed Algebra 1 can enroll in Physics 1. The mathematics involved in the course is generally limited to simple algebra. Any math beyond simple algebra that is required in physics is taught directly in the class. *Chemistry is not a prerequisite.*

### AP PHYSICS 2

Physics 1 must be completed with a B grade or better prior to enrollment in AP Physics 2. Students must have completed or be enrolled in Pre-Calculus. *Chemistry is not a prerequisite.*

**"How is my son/daughter doing in physics?" Please see the "Grades Report" at [www.phyz.org](http://www.phyz.org).**

**Grades are reported by period and listed by Student ID numbers. Physics grades in progress are not reported in Zangle.**

## ABOUT THE TEACHER

I have taught physics and AP Physics at Rio since 1986. I hold a Bachelor of Science degree (physics major, math minor) from the School of Education at the University of Michigan and a Master of Science degree in Instructional Leadership from National University. I have presented papers and demonstrations at meetings of the American Association of Physics Teachers (AAPT). I've had articles published in AAPT's academic journal, *The Physics Teacher*. I served as a mentor in a National Science Foundation-funded physics education program.

I currently serve as an appointed member of the AAPT's Committee on Physics in High Schools, and was a recipient of their Distinguished Service Citation in 2008. I was elected and served as an officer in the Northern California and Nevada Section of the AAPT, and was a recipient of their Distinguished Service Award in 2001. I am an appointed member of the State Board of Education's Assessment Review Panel, where I serve as a content advisor to the California Department of Education (CDE). I am a contributor to the high school edition of *Conceptual Physics*, and author of lab manuals for high school, and college editions of *Conceptual Physical Science* and *Conceptual Integrated Science*, as well as for the college edition of *Conceptual Physics*. I am a workshop leader for a physics teacher support program (Physics Teacher SOS). I have designed lab products and authored curriculum products sold by Arbor Scientific.

In 2012, I was selected by the CDE, the National Science Foundation, and the White House Office for Science and Technology Policy as California's Science recipient of the Presidential Award for Excellence in Mathematics and Science Teaching. I am the 25th 7-12 science teacher in California to earn this honor in California since the program's inception in 1983.

## WHAT PARENTS CAN DO TO ENCOURAGE STUDENT SUCCESS

**1. Make sure your student is completing all homework assignments on a daily basis. Physics is considered a college-prep class. Students are granted latitude in the level of homework they complete. Please see to it that your son or daughter is completing all assignments daily. THIS IS THE SINGLE MOST IMPORTANT THING A PARENT CAN DO. You do not need to check for correctness (correct answers are posted for students to check), you need only check for completeness. Try asking your son/daughter to explain a homework item to you. You may not be an expert in physics, but you do know your son/daughter; you'll be able to tell whether or not he or she is "getting it." Ask your son or daughter about "The System" and their standing in "System Points."**

2. Ask your son/daughter about what he or she is learning in physics. They should be able to describe strange and wonderful things.

3. Ask your son/daughter when the next unit test is scheduled

to take place and ask what he or she is doing to ensure success. Students are allowed to prepare notesheets or cards for use during each test; this is an important element in test preparation.

4. Ask your son/daughter about his/her current grade. Progress grades are updated monthly and graded material is returned to students on a regular basis, so each student knows his/her current standing. If your student is having difficulty, encourage him/her to see the instructor at lunch or after school for additional assistance. You can check grades in progress yourself by visiting my website ([physz.org](http://www.phyz.org)). Grades are posted in PDF format and are updated at the official marking intervals. Grades are listed by period, then by each student's ID number.

## POLICIES AND EXPECTATIONS

Your son or daughter has a copy of each. He or she should have asked you to sign the bottom of the Rules/Policies form.

## COMMUNICATIONS OPTIONS

**1. E-Mail.** I can be reached through electronic mail at [dbaird@sanjuan.edu](mailto:dbaird@sanjuan.edu). This is the most effective method of communication for me. You don't have to track me down and I don't have to track you down; we each communicate when our schedules allow. E-mail is definitely the "best value" in terms of response time and reliability.

**2. WWW.** I have a site on the World Wide Web. It includes useful information for students and parents: grades in progress, unit schedules, curriculum materials, etc. Point your browser to <http://www.phyz.org>.

**3. Voice Mail.** You can leave a voice mail message for me at 979-8931 box 05.

## WHAT ABOUT ZANGLE?

**Detailed grade reports are posted at [physz.org](http://www.phyz.org).** Less detailed "marks" are posted to Zangle. Both reports are updated at the monthly, official marking intervals. The first Zangle report will be available soon via ParentConnection. I do not use Zangle's Gradebook feature, so incremental (hourly/daily/weekly) updates will not be available between official posting dates. Please ask your son or daughter about their inter-marking period performance.

## CALIFORNIA STANDARDS & TESTING

The State of California adopted academic standards in science in 1998. The California physics standards are tested on the California Standards Test (CST) in Physics—part of the state's STAR (Standardized Testing and Reporting) program.

California's Content Standards in physics are posted at the California Department of Education's website. Start at [www.cde.ca.gov](http://www.cde.ca.gov) and follow the links to content standards in 9-12 Physics.

## SAT II PHYSICS EXAM

A number of students have asked me about their preparedness for the SAT II examination in physics. Upon reviewing the examination outline, I can say that only students who have completed **both** Physics 1 and AP Physics 2 are fully prepared for the SAT II in physics.

**"How can my daughter/son improve in Physics?" Please click the "PEPM" link at [www.phyz.org](http://www.phyz.org). For too much information about my Presidential Award adventure, see <http://physzpaemst.blogspot.com>**