



US DEPT. OF EDUCATION
BLUE RIBBON SCHOOL



PRESIDENTIAL AWARDS FOR EXCELLENCE
IN MATHEMATICS AND SCIENCE TEACHING



CALIFORNIA DISTINGUISHED
SCHOOL

RIO AMERICANO CONCEPTUAL PHYSICS

THE PROGRAM

Conceptual Physics is Rio Americano's non-lab physics course. It fulfills the San Juan Unified School District's physical science graduation requirement. The course is intended for juniors and seniors. Freshmen and sophomores who wish to complete the physical science graduation requirement enroll in Earth Science.

CONCEPTUAL PHYSICS (CP)

Conceptual Physics is intended to provide students with an introduction to physics. We will explore the concepts and relationships of physics without engaging in mathematical "number puzzles" commonly associated with physics course work. Topics include force and motion, circular motion and gravity, conservation of momentum and energy, heat and temperature, electricity and magnetism, waves, and light.

ABOUT THE TEACHER

I have taught 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 recently served as an appointed member of the AAPT's Committee on Physics in High Schools.

I was a recipient of the AAPT 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 its Distinguished Service Award in 2001. I was an appointed member of the State Board of Education's Assessment Review Panel, where I served 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 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. In 2014, I was made a fellow of the American Association of Physics Teachers

WHAT PARENTS CAN DO TO ENCOURAGE STUDENT SUCCESS

1. Make sure your student has a book checked out to them (most students leave their textbook in the physics classroom).
2. Make sure your student comes to class prepared to work, with a pencil and paper. In addition to their textbook, they need space in their school binder for their CP work.
3. Check grades in progress at [physz.org](http://www.phyz.org) > CP > "Grade Summaries". You can also check "Test Scores" and "Quiz Scores" on that page.

"How is my son/daughter doing in physics?" Please see the "Grades Report" at www.phyz.org. Go to physz.org and click "CP". Then click "Grade Summaries". Then find your student's Student 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. 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://phyz.org>.
3. Voice Mail. Messages can be left at 979-8931 box 05.

WHAT ABOUT Q?

Detailed grade reports are posted at phyz.org. After selecting the course (Conceptual Physics CP), click the link labeled "Grade Summaries". Less detailed "marks" are posted to Q. Both reports are updated at the monthly, official marking intervals. The first Q report will be available soon via ParentConnection. I do not use Q'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 progress. On the course page (CP), you can find links to more detailed "Test Scores" and "Quiz Scores". These are updated after each interim.

ENGAGE!

Some students struggle in physics. Some do not. I think physics is a difficult subject to learn, but that it's so fascinating, the effort is truly worth it.

But how can a student learn this demanding subject?

Memorization—a skill so useful in so many academic endeavors—is virtually useless in physics. (Students accustomed to academic success sometimes have their first serious setbacks in physics.) Instead, we strive to answer questions by applying and extending general principles.

Students are given opportunities to learn this way via their classwork. Classwork is where students have the opportunity to struggle with and resolve questions involving the physics at hand.

There is essential value in engaging in classroom presentations of physics concepts and hands-on activities.

But students do not take ownership of the content until they can find their way from physics questions to physics answers. Completing daily physics assignments on a daily basis is how students learn physics.

Doing classwork is not always fun. But if learning physics is the objective, completing daily assignments is the path to meeting that goal.

Getting from questions to answers can be frustrating. Very few people are born with an intuitive and complete sense of physics. Navigating from questions to answers is a struggle for nearly everyone. A wise colleague expresses this reality with the words

CONFUSION IS THE SWEAT OF LEARNING.

I often discuss answers for most of the questions I ask students to answer. Students will only learn the material if they engage with it prior to discussion. Some will copy answers from other students.

Any avoidance of the discomfort of the struggle inherent in getting from questions to answers circumvents the learning process. It provides a comforting illusion of understanding but leaves students incapable of using physics principles to guide their thinking from questions to answers. Confusion is the sweat of learning.

Being in possession of coordinated questions and answers seems useful. And there may well be courses in which such couplings have value. But a course in physics is not one of them.

Students are allowed to use classwork during tests!

ANALOGY

We can think of physics learners like budding weightlifters. In class, they learn all about weightlifting technique. The instructor even lifts weights to show them how it can be done.

For classwork, students are given weights to lift. (Some of the weights are light, some are heavy). The weights also have a safety feature: rapidly-inflating helium balloons that render the weights "weightless".

Students who lift the weights despite the struggle will learn the lesson. Students who inflate the balloons get an artificial sense of accomplishment by lifting weightless objects. Students who allow others to lift their weights while they spectate remain similarly unmuscled.

When an in-class assessment demands students lift balloon-free weights on their own, the approach they took to classwork is revealed.

HOW GRADES ARE MADE IN CONCEPTUAL PHYSICS

1. Basics (Getting Academic Credit)

Students' grades in Conceptual Physics are composed of scores in three performance areas.

Unit Tests Quizzes Participation Final Exam

Unit Tests are given at the end of each unit of study; we have about five units in each semester. Unit tests are scored on a 100-point scale. The composition of each test is spelled out on each unit schedule.

Clicker Quizzes are a classroom activity we use while preparing for each unit test. Student teams are given clickers to choose answers for each question presented on the classroom flatscreen. The score depends on how successfully the class as a whole answers the group of questions, all relating to the current unit.

Participation: Students can earn from 0 to 3 points each day. Specifics for how to earn them are provided to students. Full engagement earns 3; disengagement earns 0.

The Final Exam is administered at the end of the semester and covers material from throughout the semester. The first semester exam covers first semester topics; the second semester final exam covers second semester topics. The exam is worth 250-points.

2. Modifiers (Bonus Points and Recovering Academic Credit)

CTF: Credit Toward Final - Our version of extra credit is awarded for a variety of things throughout the semester. The points are applied to the score of the final exam. We've already had a few CTF opportunities relating to course paperwork and an online quiz on phys.org. Credit Toward Final can be gained by various activities; it can also be lost through activities. CTF-losing activities are posted in class.

TCJ: Test Correction Journal. Several days after each unit test, students review the questions and their answers in a group setting. They record journal entries for each missed item in accordance with in-class instructions. Once students have completed their TCJ journals, we take a TCJ Quiz.

The TCJ Quiz consists of ten questions from the corresponding unit test. Students are given back 10% of half the points they missed on the unit test for each quiz item they answer correctly. A student who answers all ten questions correctly gets back half the points they missed on the original test. The TCJ Quiz is usually administered several days after the corresponding TCJ day.

Why is classwork not granted academic credit?

No academic credit is granted for classwork completion for the same reason no points are given to sports teams when they show up to the game/match/meet/event. Members of the team may have practiced for several hours over the course of a week before the event. Yet when they arrive at the competition, the scoreboard shows them with a score of zero. If the team works so hard at practice, why is this work not acknowledged on the scoreboard? And if there is no scoreboard acknowledgement of practice, why do teams practice before competitions? Classwork is practice; tests are the "competitive event".

ALL POLICIES ARE SUBJECT TO CHANGE *WITH* NOTICE.

A	B	C	D	F
90%–100%	80%–89%	70%–79%	60%–69%	0%–59%

Conceptual Physics Expectations and Participation

The day-to-day business of Conceptual Physics involves reading, writing, listening, and responding in various ways at various times. The course is geared for success, and paced to accommodate a variety of learners.

Be prepared for class. You will need paper and a pencil every day. You will be allowed to store your textbook in the classroom; you may elect to keep it with you. Students who are not prepared for class may be assigned detention.

The hall pass may be used by one student at a time. The hall pass must be completed by the student and signed by the instructor, and has a negative impact on your extra credit (CTF). Limit: one use of the hall pass per student per week.

Engaging in off-task behavior, food/drink, out of seat violations will result in a drop in citizenship, after school detention, or both. Accumulated waste paper is to be disposed of properly only at the end of the period.

Visible phone = Saturday School. Phones are to be powered off and stored in your pack, which is in the rack during class time. Further warnings will not be given.

Textbook Chapter Sections and Questions

Read each section and answer the assigned questions. When finished, work silently on the crossword, homework from other classes, or read a book. When asked to do so, turn the work in. Work completed **in accordance with instructions** will be returned to you for use on the unit test. Remain in your assigned seat at all times.

Video Presentation

Listen and watch for answers to questions; record answers quickly while the presentation plays. If time allows, you may collaborate with GROUP partners briefly after the presentation. Remain in your assigned seat at all times.

Demonstration

Answer questions on the demonstration handout. Some will require predictions; some will require observations of the demonstration. Some answers will be yours, alone; some will involve group discussion. Remain in your assigned seat at all times.

Clicker Quiz

Answer the questions presented using the clicker provided. When the time for a question has expired, the polling will close and the answer will be revealed. Your Clicker Quiz score depends on your participation and is improved by having more correct answers. Some questions from the Clicker Quiz will appear on the unit test.

Test Corrections

1. You will be given your answer document from the previous unit test.
2. The instructor will direct you to today's new seating zones, based on which form of the test you had.
3. You will have access to your test form and classmates who had the same form. Collaborate with them to complete the Test Corrections form in accordance with instructions.
4. Turn in your corrections when you are done; work quietly on other class or school work until everyone's done.
5. Complete and turn in the Test Correction Quiz; work quietly on other class or school work until everyone's done.

Unit Test

You may use the chapter classwork, activity and video question sheets returned to you by the instructor. You may also use your crossword. Use a pencil to mark your answers.

When you are done, turn in

1. the test
2. your answers
3. your classwork and crossword.

You will be allowed to use the work turned in after the test on the semester final as well.