

STRENGTHENING
SCIENCE EDUCATION
IN CALIFORNIA



A Priority for California's Future:
Science for Students
Summary Report

The Center for the Future of Teaching and Learning
Research conducted by Belden Russonello & Stewart
Funded by a grant from S.D. Bechtel, Jr. Foundation

A Priority for California's Future: Science for Students summarizes public opinion research examining the public's awareness and attitudes about science education in California. The research was conducted in support of Strengthening Science Education in California, a new initiative that brings together educators, researchers, and others to examine the status of science teaching and learning and to develop recommendations for improving science education in California. Partners in this initiative include the Center for the Future of Teaching and Learning, the University of California, Berkeley's Lawrence Hall of Science, SRI International, Belden Russonello & Stewart, Stone's Throw Communications and Inverness Research.



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This public opinion research was conducted by Belden Russonello & Stewart. Support in the development of the survey was provided by the Center for the Future of Teaching and Learning, SRI International, and the University of California, Berkeley's Lawrence Hall of Science.

A Priority for California's Future: Science for Students is the first in a series of reports about research efforts to be conducted and published by partners in the Strengthening Science Education in California Initiative. We began with this public opinion research effort because we believe that understanding what the public thinks, understands, and the degree to which Californians care about science education is a critical first step in strengthening scientific literacy in our state. Our intent is to share the findings of this survey, as well as our subsequent research efforts, with educators, policymakers and the public in ways that stir debate and inform decision-making which results in more and better science education for the students of California. Like the public, we believe that doing so is critical to the future of California.

Funding for this initiative was generously provided by:

S.D. Bechtel, Jr. Foundation

Editorial and promotional services by Stone's Throw Communications of Manhattan Beach, CA.
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A Priority for California's Future:

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Summary Report

STRENGTHENING **SCIENCE EDUCATION** IN CALIFORNIA

The Center for the Future of Teaching and Learning

Research conducted by Belden Russonello & Stewart



A Priority for California's Future – Science for Students

The Strengthening Science in California Initiative has brought together colleagues who are deeply concerned that too few students are getting the breadth or depth of science education they need. There is no shortage of hard evidence to support this viewpoint. On the National Assessment of Educational Progress science tests, California students are near the bottom of the pack with 56% at the “below basic” level. And the United States is well down the list internationally on science achievement, a status that will likely continue if current conditions prevail. There is also evidence that California’s teachers don’t have the capacity or supports necessary to teach science well. Further, added to the list of concerns, severe budget cuts in the state have led to significant reductions in funds for science programs, including training for science teachers.

We care about improving science education in California and believe our state can do a much better job at providing greater opportunities for students to become scientifically literate. So we wanted to find out what average Californians thought about science educational opportunities and for that

we turned to respected public opinion researchers for answers.

In the following pages we examine Californians’ views on science education. The findings are based on telephone interviews with 1,004 adults conducted April 7-22, 2010. Cell phone and Spanish language interviews were included to provide more complete coverage of California’s population. In order to enhance understanding of the survey findings we also conducted a series of six focus groups in three different regions of the state (Sacramento, San Francisco and Los Angeles) where the public shared their thoughts on science education. The focus groups included sessions with the general public, African American, Asian and Latino subgroups, as well as parents and members of the scientific community.

Through these activities we learned that the public certainly sees the importance of a sound science education for students, beginning in elementary school and continuing through high school. And the public senses an urgency to improve science education in California.

Here is what we found:



Almost everything you do, everything almost daily, is based on science.

— Parent, Sacramento



Science is Essential

Californians believe that science education is important and should be a priority for their schools. In their view, knowledge and understanding of science are key to keeping California and America at the forefront of technology and innovation, and essential to young people as they prepare to compete in a rapidly changing world. Ranked in importance alongside reading, mathematics, and computer literacy, science education is seen as fundamental to the development of critical thinking and problem solving skills that serve individuals well across subject areas, and valued for its potential economic benefit. From developing technologies that will protect our environment to creating new jobs that will drive our economy, understanding science is seen as essential to preparing for the future.

To meet that challenge, the state’s residents believe that California should start to teach science early in order to prepare students to succeed in high school and beyond, and want schools to teach science at every grade level. To strengthen science education, Californians think teachers should have more preparation and training, and they want more resources and better equipment for schools and classrooms. They also believe more time should be spent teaching science to California’s students.

S*cience is one of the basic fundamentals. You need to know how to read, you need to know how to write, and you need to know how things work, and that’s science.*

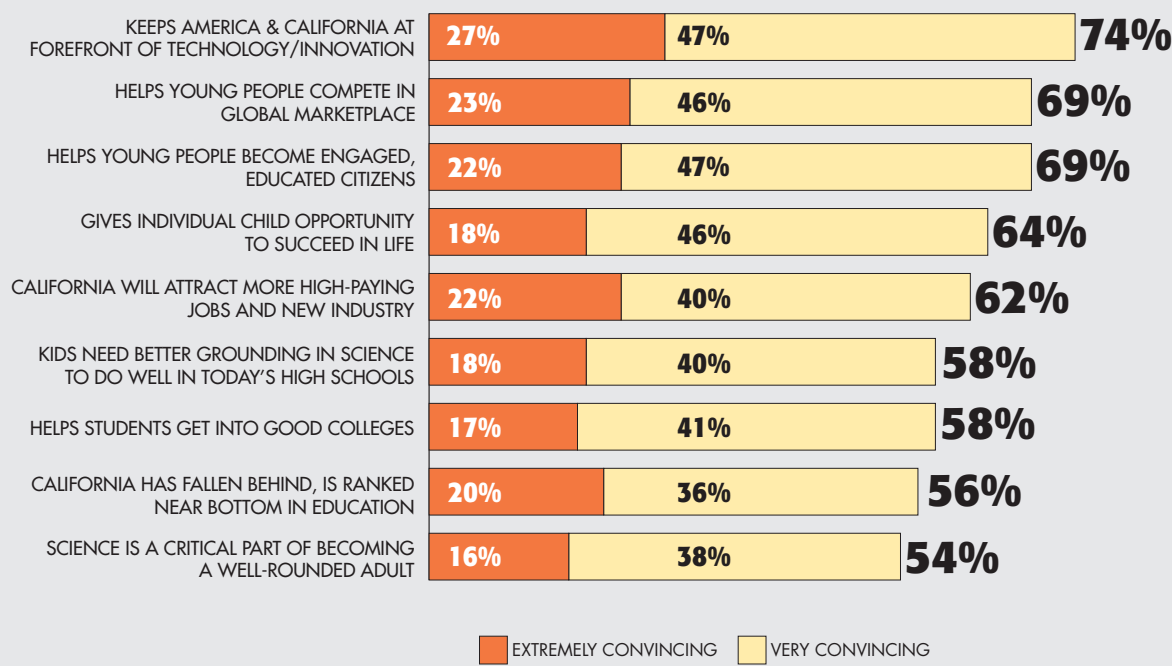
.....
– Parent, Sacramento



Science Education is Key to a Brighter Future for California

Californians believe that science education is key to the future of the state. Three quarters are very convinced that science should be a higher priority for California schools because it keeps both America and California at the forefront of technology and innovation. Another seven in ten each (69%) are persuaded that science helps young people compete in the global marketplace and become engaged citizens. Sixty-two percent are convinced that making science a higher priority will attract industry to the state and provide a gateway to higher paying jobs. (See Chart 1.)

Chart 1: Reasons for Science to be a Higher Priority in California Public Schools



Science is the basis of everything you touch so I think science is just as important as math and reading, or even more so.

— Non-parent, Sacramento

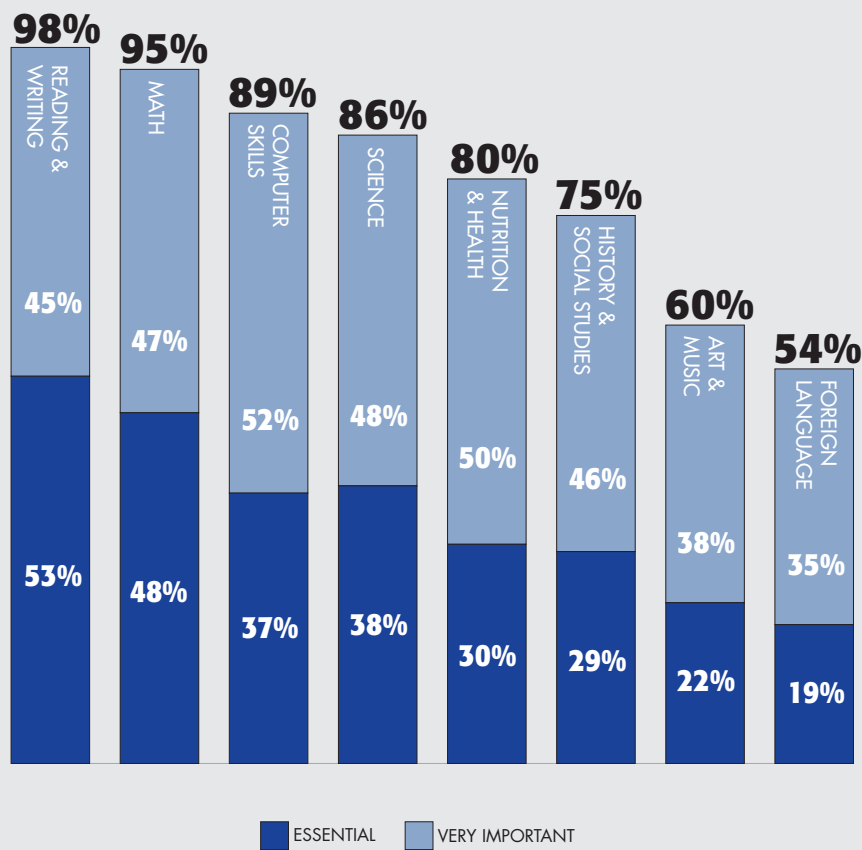


Teaching Science Should be a High Priority for all of California's Schools

Californians see the need for better schools. Sixty-one percent say improving schools should be the state's *top* priority.

And when it comes to what schools deliver, Californians believe that science education is very important for *all* children at *all* grade levels, regardless of their higher education or career goals. Nearly nine out of ten surveyed (86%) view science as very important or essential. After reading and writing and mathematics, science, along with computer skills, is viewed as the most important subject for students to learn. (See *Chart 2*.)

Chart 2: Importance of Subject Areas



Science Education Should Start Early

As far as Californians are concerned, the earlier students are introduced to science the better. A full seven in ten say that learning science should begin in elementary school in order for students to succeed in high school. Furthermore, six in ten say students should be learning science by the third grade. (See Chart 3.)

Those in the focus groups strongly agree with the idea of starting to teach science early. Parents and non-parents alike said that engaging children in science when they are young helps to capture their curiosity and foster a love of learning.

Californians make a direct connection between early access to science education and future success in more advanced science classes in high school and college. Eight in ten say science in elementary school is essential or very important to doing well in more advanced science classes. (See Chart 4.)

Chart 3: When Science Should be Introduced

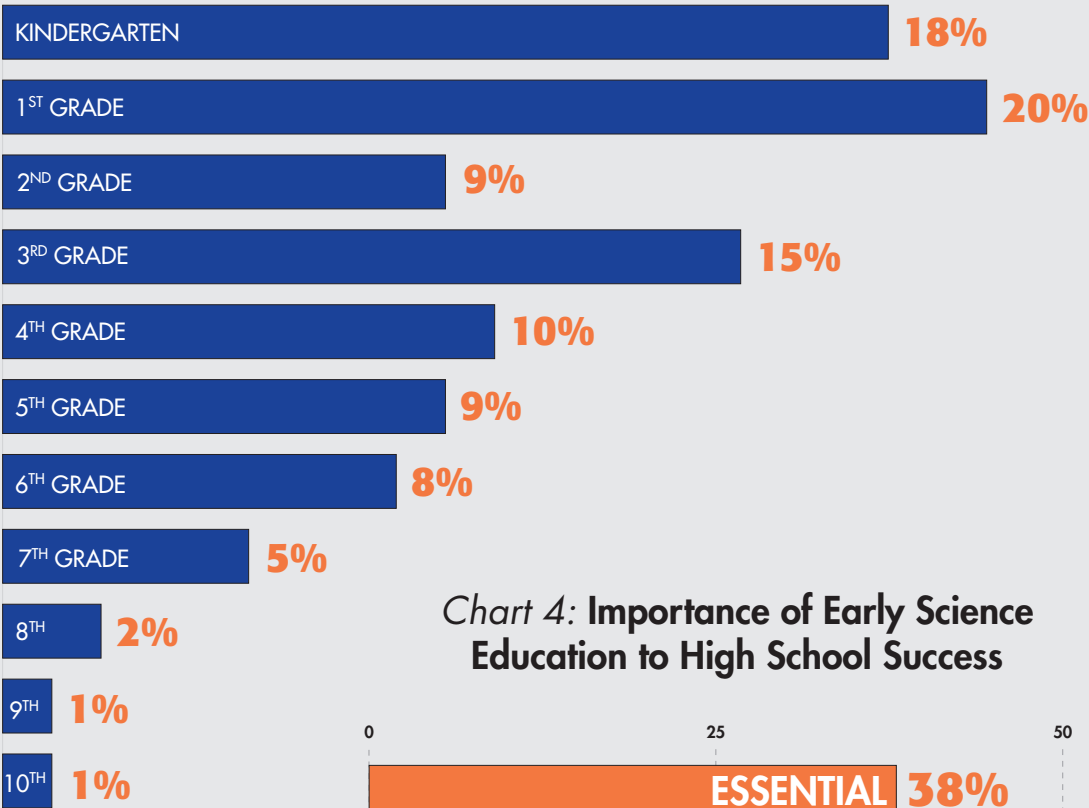
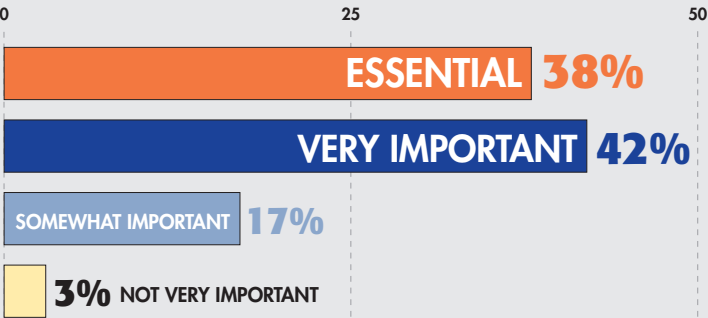


Chart 4: Importance of Early Science Education to High School Success

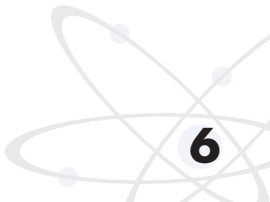
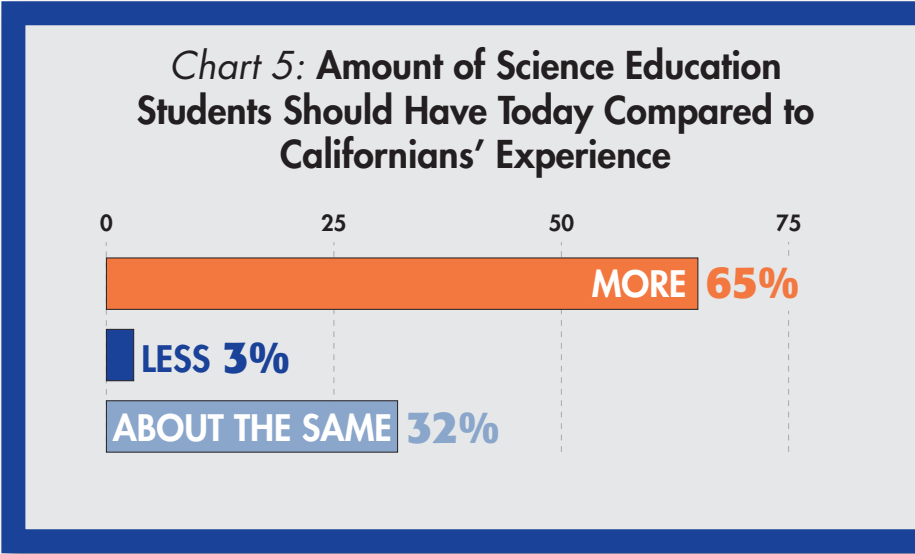




And There Should Be More of It

Californians are aware that science is becoming increasingly important in today's world. Two-thirds believe that students today should receive more science education than they themselves did. African Americans (89%), Latinos (75%) and older Californians (81%) are most likely to say students should have more science education than they had when they were in school.

It is interesting to note that only one-third say that students should receive the same amount of science education they did. (See *Chart 5*.) The most likely to believe students should receive the same amount are whites and upper income (43% of whites and 39% of those with incomes over \$100,000 chose this answer).



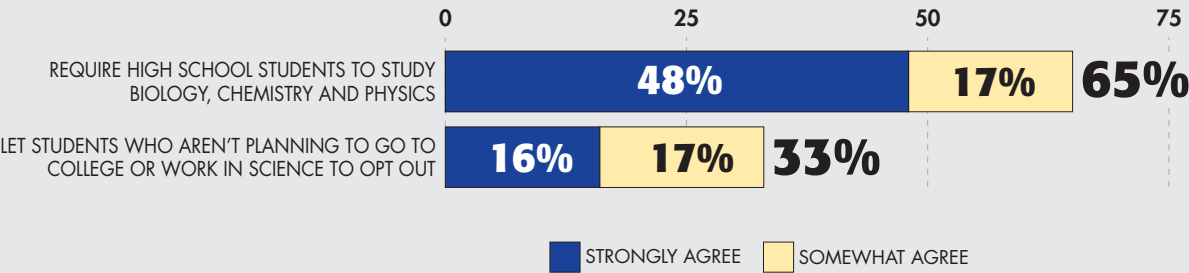
Californians Believe That *All* Students Should Study Science in High School

To better understand the public’s views about the importance of science education, participants were asked if *all* students should study science in high school, or if some who may not go on to college or to work in science-related fields should be allowed to opt out.

Again, science comes out on top, with two-thirds of Californians saying all high school students should be required to study biology, chemistry and physics. (See *Chart 6*.)

Those who feel strongest that the sciences should be a requirement for high school students include those with the lowest levels of education and income (70% high school degree or less, 72% income \$25,000 or less), as well as 75% of Latinos.

Chart 6: Require Biology, Chemistry and Physics in High School



Very few students in the public schools will focus their life or make their money out of the scientific profession. So why is it important for everybody to know? It’s the basis for understanding almost everything.

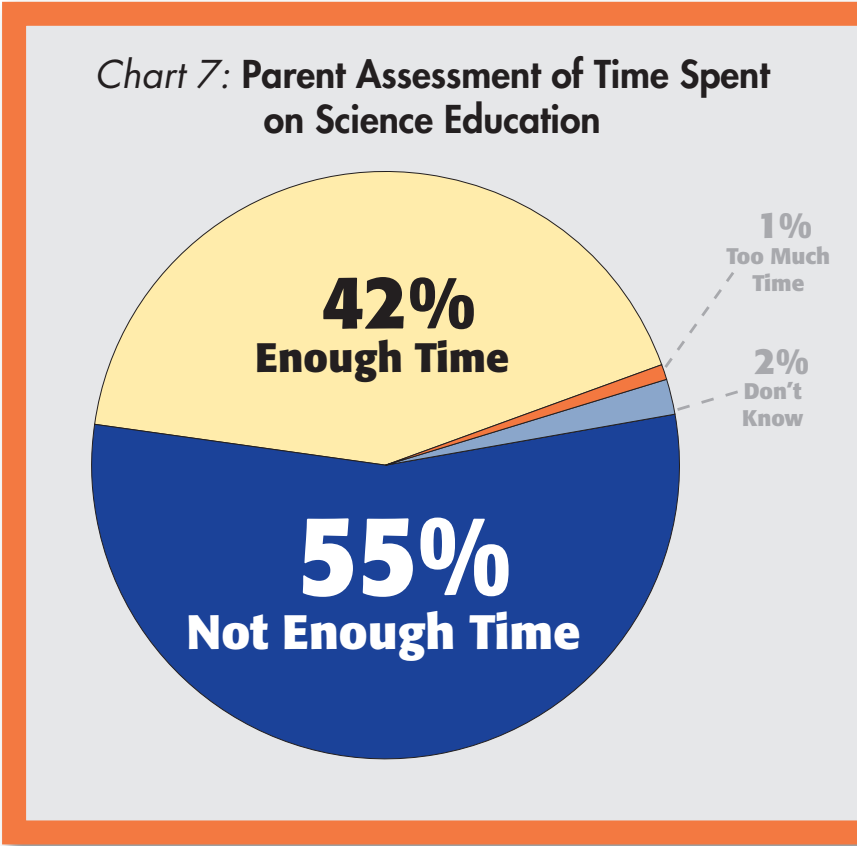
– Non-parent, Sacramento



And Think Students Do Not Spend Enough Time Studying Science

Over half of all parents of K-12 students *do not* believe that enough time is spent on their children’s science education. (See Chart 7.)

Latino parents (63%) are more likely than other groups to say that their children *do not* spend enough time learning science in school.



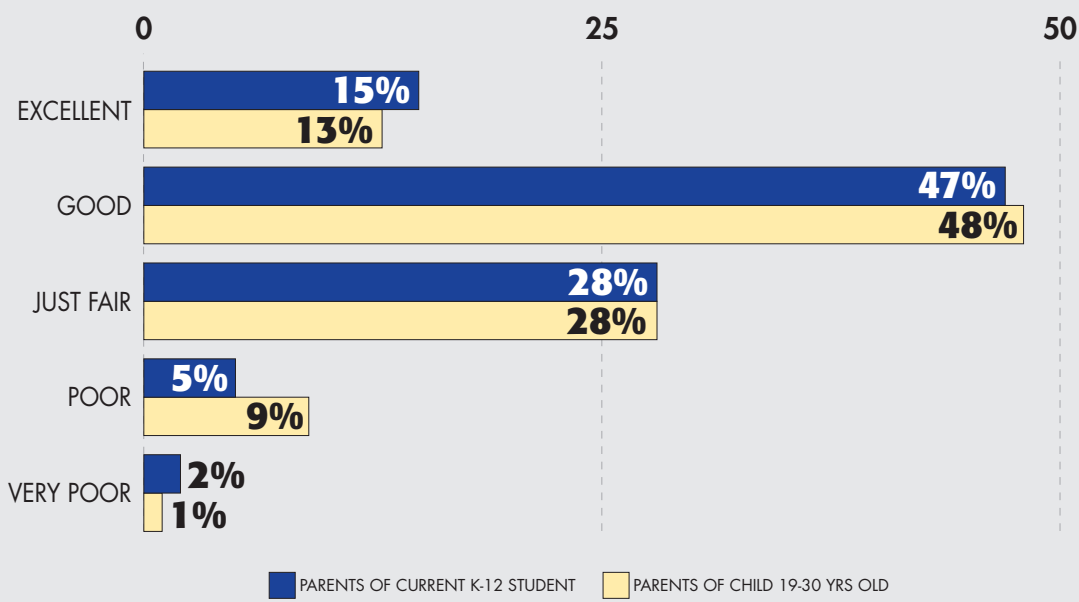
Californians Give Science Education Positive Reviews

When asked about the quality of science education in their children’s schools, most parents give positive reviews, though few say it is excellent. Forty-seven percent of parents currently with children in school rate science education as good, an additional 15% say it’s excellent. (See *Chart 8.*)

Parents most likely to say their K-12 children’s science education is excellent or good include those living in suburban areas (71%) and with incomes of \$100,000 or more (70%). In contrast, only 57% of those living in urban areas and 61% of those with incomes between \$25,000-50,000 say that the science education their K-12 children have received is excellent or good.

But focus group participants shed interesting light on these findings: While some parents report they are impressed with the science their children are learning, many admit they do not know much about the science programs at their child’s school.

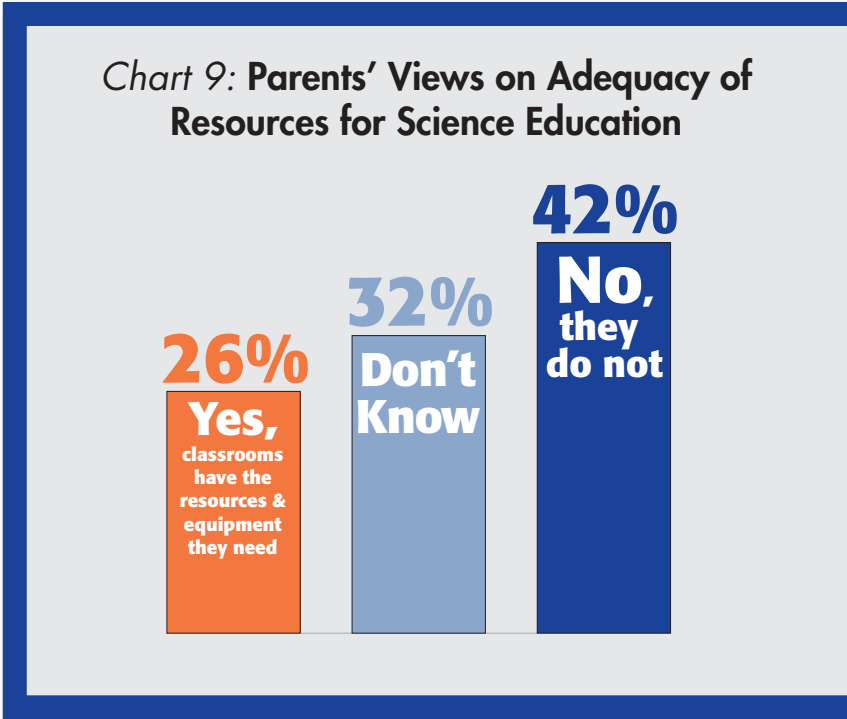
Chart 8: Parent Assessment of Quality of Science Education





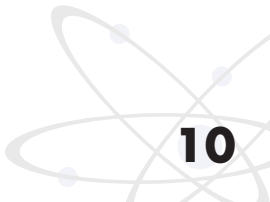
But Doubt Science Classes Have the Resources They Need

Close to a third of parents say they don't know if classrooms have the resources and equipment students need. But even more say that classrooms do not have the resources and equipment needed for science education. (See *Chart 9.*) Only about a quarter of parents say students have the resources and equipment they need.



You can't teach a child to read without a book, so how are you expected to teach science without the supportive materials.

— Parent, Sacramento



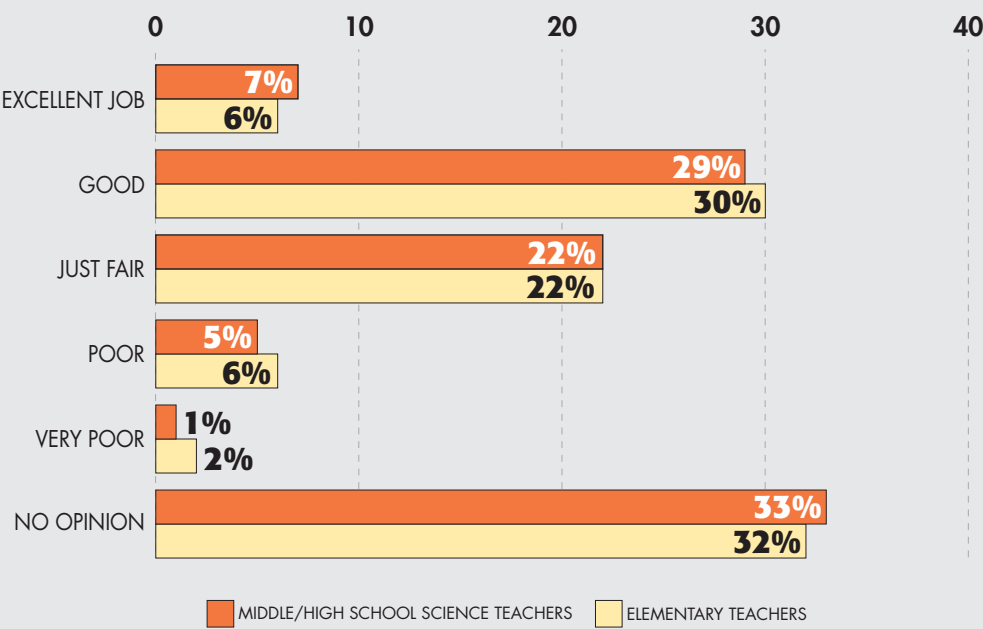
Californians Support Teachers, but Are Unsure About the Quality of Science Instruction

The public generally views teachers positively. Over half of the respondents said that teachers are good (44%) or excellent (7%). The public rates teachers in their local schools even higher (47% good, 15% excellent).

But when it comes to helping students to learn science, the public is not so sure how well teachers are doing. Just over a third believe that elementary teachers do a good (30%) or excellent (6%) job helping students to learn science. Middle and high school teachers receive similar ratings. It is important to note that one-third of respondents say they do not know enough to have an opinion about the quality of science teachers. (See Chart 10.)

Participants in the focus groups also had a hard time rating science teachers due to lack of information, but did note that student experiences with science education can vary greatly depending on the preparedness and enthusiasm of the teacher.

Chart 10: Job Rating for California Science Teachers

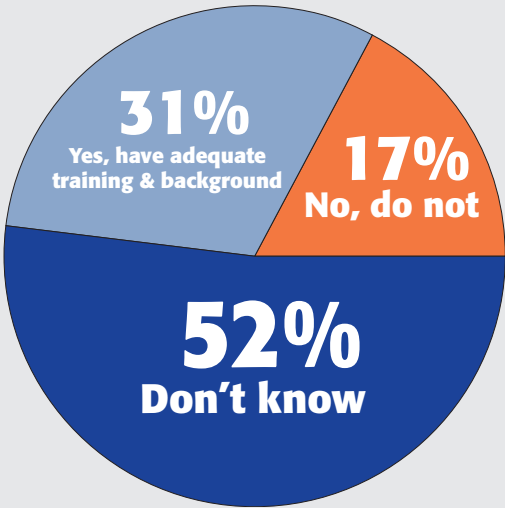




Are Teachers Prepared Well Enough to Teach Science?

Even parents are unsure if teachers have the training and background they need to teach science effectively. More than half of parents say they do not know if their child’s science teachers have the background and training needed to teach science well. Less than a third say that teachers do have the background and training they need. (See Chart 11.)

Chart 11: Parents’ Beliefs about Adequacy of Teachers’ Science Training and Background



f the teachers are the source of science knowledge and they don't have [the knowledge], they're not going to be able to teach science. They're not going to be able to impart it to the students. It has to start with them.

– Non-parent, Sacramento



How to Improve Science Education – The Public’s View

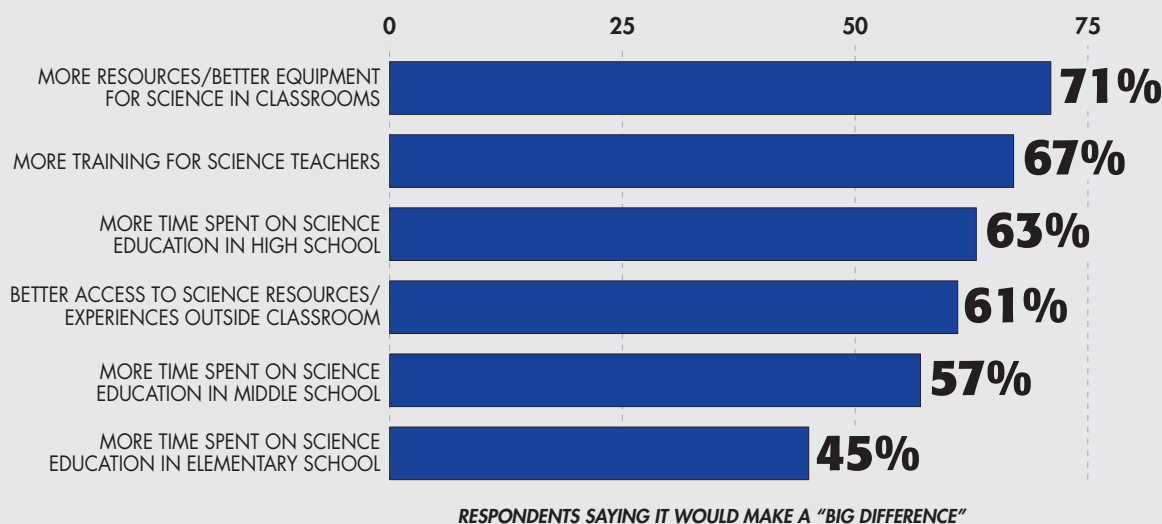
Californians believe that well prepared teachers, adequate resources and more time teaching science are key to improving science education. The state’s residents have some specific ideas about what is needed to improve science education. (See *Chart 12.*) The top three suggestions are:

More Resources and Better Equipment Needed

Seven in ten think that more resources and better equipment make a big difference in science education.

Those most likely to say that more resources and better equipment would make a big difference include African Americans (85%), Latinos (79%) and those earning \$25,000-\$50,000 annually (77%).

Chart 12: Ideas for Improving Science Education in California





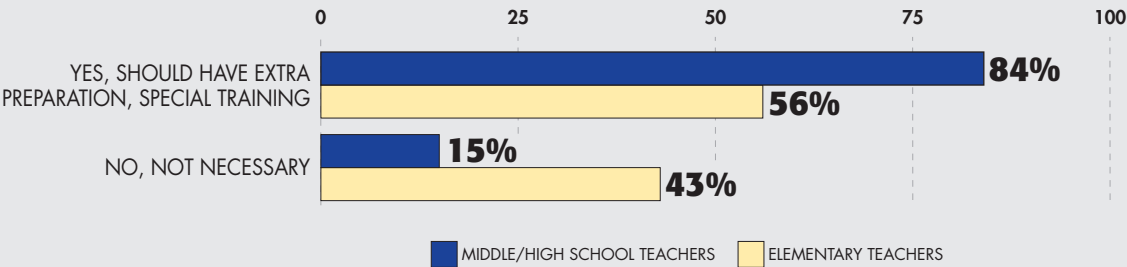
More Knowledge and Support for Teachers Needed

The survey finds very strong support for teachers to receive more training to teach science. (African Americans and Latinos are more likely to want to see more training for teachers than whites.) In addition, 84% of those surveyed say that middle and high school science teachers should have *extra* preparation and special training. (See *Chart 13*.)

More than half say that elementary teachers also should have more preparation and training. Latinos (67%), African Americans (66%) and those earning low incomes (62% of those with incomes under \$25,000) are among those most likely to say elementary teachers should have special training.

Participants in the focus groups note that scientific knowledge is always evolving and educators need to keep up to date.

Chart 13: Views on the Need for Extra Preparation to Teach Science



More Time Spent on Science Needed

Californians believe that teaching science at all grade levels ranks among the most influential ways in which science literacy can be strengthened. Exposing students to science from Kindergarten forward is recognized as an important building block for success, and becoming interested in science early on is seen as important for developing critical thinking skills and building interest in science for the upper grades.



Conclusion

This public opinion survey makes several things perfectly clear: Californians believe science education is important and want it to be a priority for the state’s schools. They think that science should be taught early and more often, and that schools should have the resources and equipment they need to teach it well. There is strong support for providing special training and support for teachers. The data also revealed that groups which have been historically underrepresented are more likely to perceive the science education in their schools to be lacking than do other groups. As work to strengthen schools in our state proceeds, we would do well to listen to the public as a whole, as well as the voices of specific groups, and take steps to strengthen science education in California.

This report is intended to provide philanthropy, policy makers, educators, advocates, and others with practical, useable information about what the public understands, thinks, and values about science education. We urge consideration of the public’s interests as program, policy, and budget decisions are made that impact science education in California’s schools and classrooms.

Placing more emphasis on science in K-12 opens the doors to understanding the physical universe, logic, critical thinking, and rational behavior as children mature and grow into adulthood and become citizens within our society.

– Non-parent, Sacramento



About this Document

This report is available for download on our website, www.cftl.org.

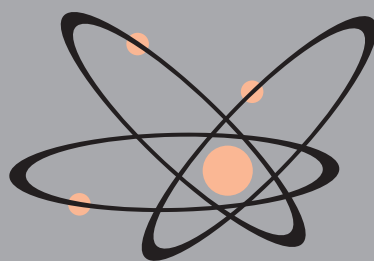
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The Center

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