



1111 Franklin Street
Oakland, California 94607-5200
Phone: (510) 987-9074
Fax: (510) 987-9086
<http://www.ucop.edu>

March 24, 2011

The Honorable Mark Leno
Chair, Joint Legislative Budget Committee
1020 N Street, Room 553
Sacramento, California 95814

Dear Senator Leno:

Pursuant to Item 6440-001-0001 of the 2010-11 Budget Act, enclosed is the University of California's report to the Legislature on the *California State Summer School for Mathematics and Science (COSMOS), 2006-2010*.

If you have any questions regarding this report, Associate Vice President Debora Obley would be pleased to speak with you. She can be reached by telephone at (510) 987-9112, or by email at Debora.Obley@ucop.edu.

With best wishes, I am,

Sincerely yours,

Mark G. Yudof
President

Enclosure

cc: Mr. Gregory Schmidt, Secretary of the Senate
Ms. Jody Martin, Joint Legislative Budget Committee
Ms. Tina McGree, Legislative Analyst's Office
Mr. Dotson Wilson, Chief Clerk of the Assembly
Ms. Amy Leach, Office of the Chief Clerk of the Assembly
Ms. Diane Anderson, Legislative Counsel Bureau
Provost and Executive Vice President Lawrence Pitts
Vice Provost Russell Rumberger
Executive Vice President Nathan Brostrom
Vice President Patrick Lenz
Associate Vice President and Director Steve Juarez
Associate Vice President Debora Obley
Executive Director Jenny Kao
Executive Director Yvette Gullatt

**Report on University of California State Summer School for
Mathematics and Science (COSMOS), 2006-2010**

April 2011
Legislative Report

**An investment in UC pays
dividends far beyond what
can be measured in dollars.
An educated, high-achieving
citizenry is priceless.**

University of California Office of the President



UNIVERSITY OF CALIFORNIA, CALIFORNIA STATE SUMMER SCHOOL FOR MATHEMATICS AND SCIENCE (COSMOS), 2006-2010

OFFICE OF THE VICE PROVOST
EDUCATION PARTNERSHIPS

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University of California
Report on the California State Summer School for
Mathematics and Science, 2006-2010
April 2011

Legislative Request

Item 6440-001-0001 of the 2010-11 Budget Act requires the University of California (UC) to provide a report to the Legislature on *COSMOS Program Outcomes and Effectiveness*. The Budget Act reads:

“7. Of the funds appropriated in Schedule (1), \$1,897,200 is for the California State Summer School for Mathematics and Science (COSMOS). The University of California shall report on the outcomes and effectiveness of COSMOS every five years, commencing April 1, 2011.”

Section 8669.1 of the Education Code reads:

"It is the intent of the Legislature that the University of California conduct an evaluation on the effectiveness of the California State Summer School for Mathematics and Science every two years from the effective date of the act that amends this section."

UCOP Response

The California Legislature established the California State Summer School for Mathematics and Science (COSMOS) in 1998 (Assembly Bill 2536), with the goal of engaging highly talented and motivated students in an intensive program of study, experimentation, and activities to further their interests and skills in science, technology, engineering, and mathematics. The Request for Proposal to host COSMOS was awarded to the University of California and the program launched at Irvine and Santa Cruz in 2000. Due to high demand, UC added two additional campuses: Davis in 2001, and San Diego in 2004.

The long-term goals of the COSMOS program require a multi-year examination of how COSMOS participants fare. This COSMOS report to the Legislature covers summer 2006 through summer 2010 and provides program and participant information, alumni college destination, and faculty review panel findings.

Executive Summary

- From summer 2006 through summer 2010, 3,154 students have participated in COSMOS. Over time enrollment has risen from 543 in summer 2006 to 701 in summer 2010.
- The demand for admission to COSMOS is strong and has been since its inception. About 50% of applicants are admitted to COSMOS.
- Using higher education enrollment data from the National Student Clearinghouse, UC tracked 2,355 COSMOS graduates (75% of the total COSMOS alumni population from summer 2006 through summer 2010) – all of whom have been admitted to colleges or universities.
- Of the 2,355 COSMOS alumni enrolled in colleges or universities, 2,070 (88%) were enrolled in four-year colleges: 1,297 (55%) enrolled at UC campuses, 622 (26%) enrolled at private universities, and 151 (6%) enrolled at California State University campuses. Another 250 (11%) enrolled in California Community Colleges (two-year programs).
- Among the 1,297 COSMOS alumni who enrolled at UC campuses, 31% enrolled at UC Berkeley, 19% at UC San Diego, 15% at UC Los Angeles, 13% at UC Davis, 9% at UC Irvine, 5% each at UC Santa Cruz and UC Santa Barbara, 2% at UC Riverside, and 1% at UC Merced.
- Of the 1,297 COSMOS alumni enrolled at UC campuses, UC has obtained information on the majors declared by 1,114 (86%) of them. Of these 1,114 students, two-thirds (66%) have declared science, technology, engineering, and mathematics (STEM) majors.
- After UC, the top ten universities at which COSMOS alumni most often enrolled are (1) Stanford, (2) Massachusetts Institute of Technology, (3) University of Southern California, (4) California Polytechnic State University, (5) Harvard, (6) California Institute of Technology, (7) Cornell, (8) Brown, (9) Princeton, and (10) Johns Hopkins.

Mission and Goals

It is the mission of the COSMOS program to provide outstanding high school students in STEM disciplines with opportunities to delve deeply into their subjects and to prepare for careers in the STEM fields.

In 2002, the University of California convened an expert advisory board to design the COSMOS program. The board set out the following goals for the COSMOS program:

- To engage talented students in high-level teaching and learning;
- To establish a community of scholars that fosters analytical thinking and experimentation;
- To connect students to institutions of higher learning and research facilities;
- To develop models for excellence in science and mathematics education; and
- To ensure that the COSMOS student body reflects California's geographic, economic, and cultural diversity.

Evaluation Questions

In consultation with the advisory board, COSMOS program directors and faculty agreed to collect information, listed below, to evaluate program performance over time. In particular, UC officials want to know about COSMOS participants, the skills they are learning, and whether COSMOS students advance to good universities:

- Is COSMOS attracting the best and the brightest students into STEM fields?
- How many students participate in COSMOS?
- Do COSMOS students reflect California's diversity?
- Can eligible students afford to attend COSMOS?
- What skills are COSMOS students learning?
- Do COSMOS alumni advance to good universities and major in STEM fields?

Program Description

COSMOS summer sessions last four weeks and straddle state fiscal years. For funding purposes, each summer session is aligned with the earlier fiscal year; for example, the summer 2010 session is funded from FY 09-10 dollars.

In the course of a four-week summer session, COSMOS courses or “clusters” address advanced topics in the STEM fields that go well beyond the typical high school curriculum. COSMOS clusters typically consist of two science and/or mathematics courses, and a science communication course. (Science communication courses teach students how to present science projects to diverse audiences.) The clusters vary by campus and by session but have included such subjects as astronomy, aerospace and mechanical engineering, biomedical sciences, computer science, ecology, marine science, robotics, game theory, and more. (Please see Appendix A for a list of COSMOS courses that will be offered in the summer of 2011, by campus.)

The cluster courses are intensive, emphasizing current research underway at the University of California. Distinguished faculty and researchers teach the COSMOS courses and supervise the students. Typically 18 to 25 students participate in a given COSMOS cluster, and the ratio of students to faculty is usually five to one. On weekdays, students typically work from 9:00 a.m. to 4:00 p.m. in University classrooms (attending lectures and discussions) and laboratories, augmented with field trips and/or fieldwork.

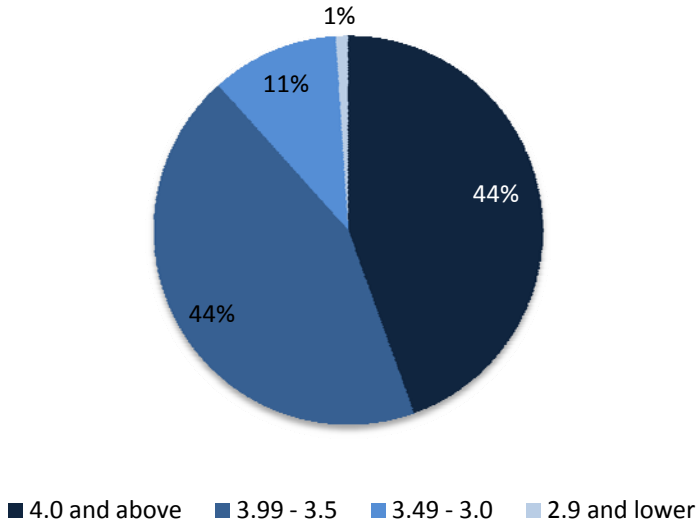
Students are required to live on campus for the duration of the program, which gives them many opportunities to form lasting friendships with like-minded peers who share the same interests in mathematics and science. Evening and weekend activities, including recreational activities and additional field trips, are planned and supervised.

A statewide advisory board composed of scientific and technological leaders in higher education and industry guides the COSMOS program. Representatives include faculty of the University of California and public and private universities, as well as leaders from the business and non-profit community. (Please see Appendix B for a list of current advisory board members.)

Caliber and Number of Student Participants

Caliber of Participants – Each campus can accommodate only about 150 participants per summer session, so selection is competitive. From summer 2006 through summer 2010, more than 6,012 students applied, and COSMOS has served 3,154 participants, an admission rate of 52%. Applicants must demonstrate academic excellence. Nearly all COSMOS students have a Grade Point Average of 3.5 or higher, and almost half have a 4.0 or above (Display 1).

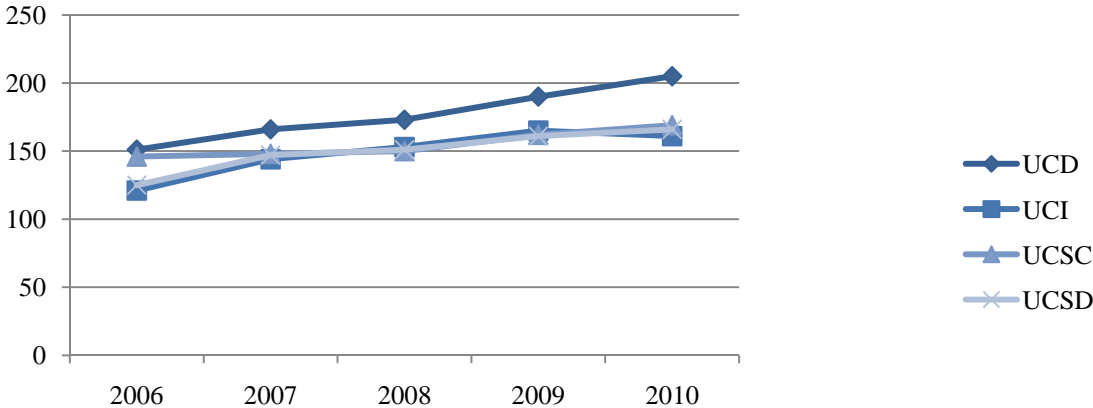
Display 1: COSMOS Participant Grade Point Averages



Source: COSMOS enrollment database.
Note: Percentages may not add to 100 due to rounding.

Number of Participants – Display 2 indicates a steady rise in the number of students participating in COSMOS from 543 in 2006 to 701 in 2010, an increase of 29%.

Display 2: COSMOS Participants by Campus and Year



Display 2: COSMOS Participants by Campus and Year (Continued)

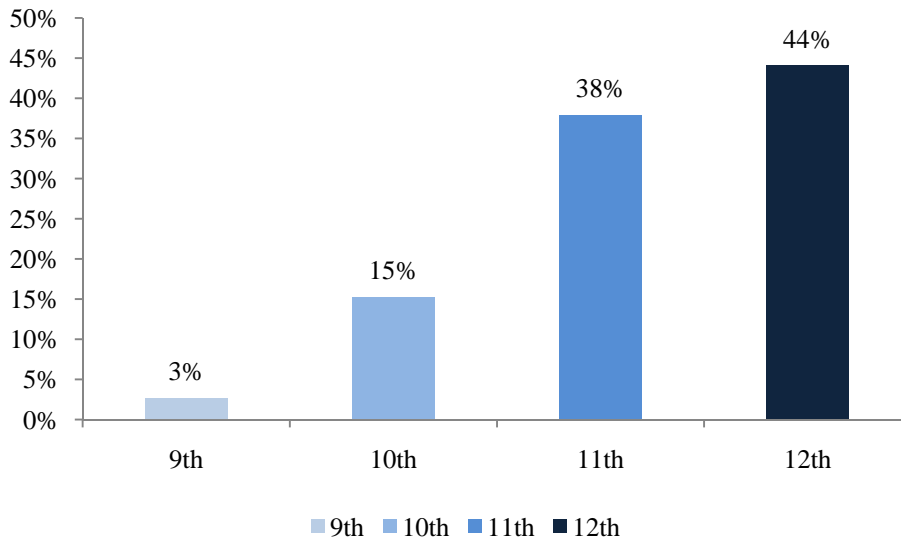
Campus	Summer 2006	Summer 2007	Summer 2008	Summer 2009	Summer 2010	2006-2010
UCD	151	166	173	190	205	885
UCI	121	144	153	165	161	744
UCSC	146	148	150	162	169	775
UCSD	125	147	151	161	166	750
Total	543	605	627	678	701	3,154

Source: COSMOS enrollment database.

Demographics of Student Participants

Grade Level of Participants – As mandated by the authorizing legislation, COSMOS participants may apply as early as the eighth grade to attend a summer session before entering high school. Students who just graduated from high school may also apply, but this is rare. The majority of participants are already in high school when they apply. Display 3 shows the percentages of students by grade level. Three percent applied as eighth graders to participate in a COSMOS session before beginning their freshman year of high school. Most students participated in the summer before their junior (38%) or senior year (44%).

Display 3: COSMOS Participants by Grade, 2006-2010



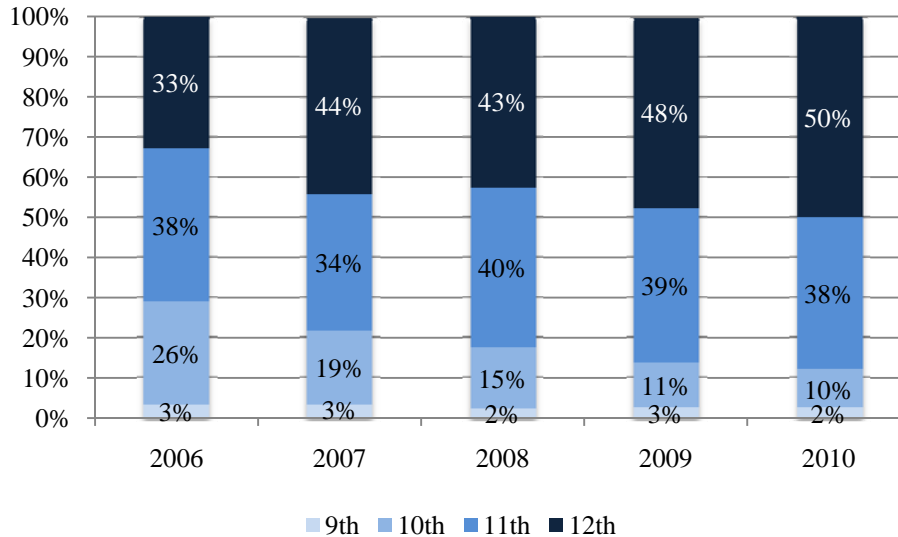
Source: COSMOS enrollment database.

Note: Percentages may not add to 100 due to rounding.

Note: Percentages based on 2,967 records; 187 records did not capture grade information.

Over time, participation by grade level has shifted: the number of students participating in COSMOS in the summer prior to their sophomore year (10th grade) has dropped from 26% in 2006 to 10% in 2010. Meanwhile, the number of students participating prior to their senior year (12th grade) has grown, from 33% in summer 2006 to 50% in summer 2010 (Display 4).

Display 4: COSMOS Participants by Grade and Year



Source: COSMOS enrollment database.

Note: Percentages may not add to 100 due to rounding.

Gender and Ethnicity of Participants – COSMOS students are evenly split between male and female participants. From 2006-2010, male participants comprise 50.4% and female participants comprise 49.6%.

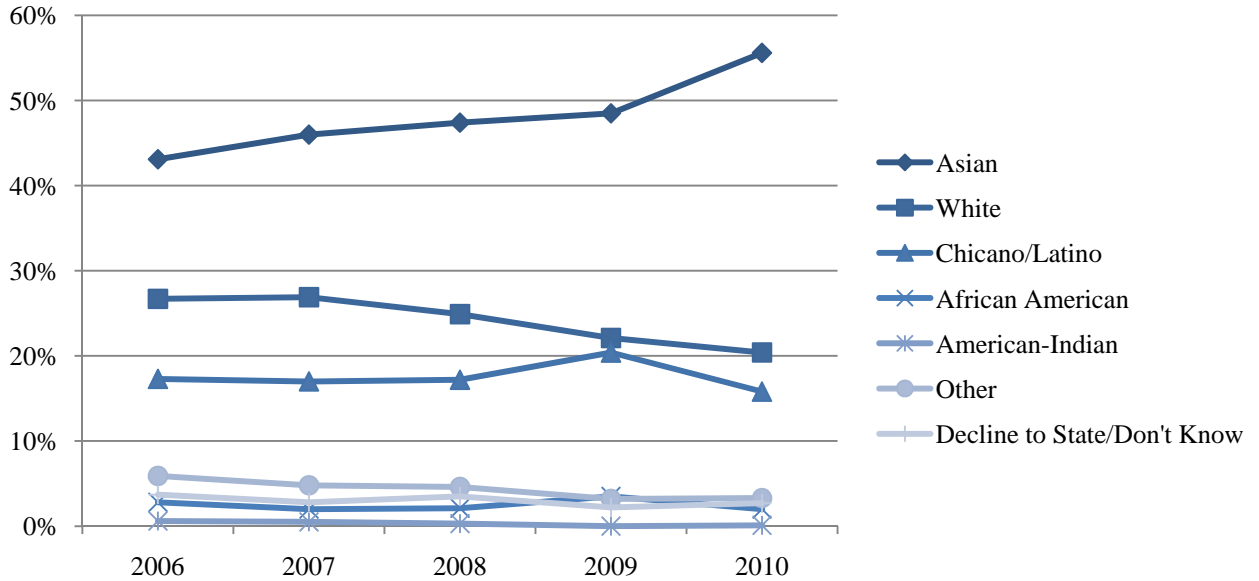
From 2006-2010, according to the COSMOS enrollment database, Asian students made up 48.1% of COSMOS participants, followed by 24.2% White, 17.5% Chicano/Latino, 2.3% African American, and 0.3% American Indian students (Display 5, COSMOS enrollment database). During the 2005-2009 academic years, the statewide K-12 enrollment was 11.6% Asian, 28.6% White, 48.8% Chicano/Latino, 7.4% African American, and 0.8% American Indian (California Department of Education Data Quest).

Display 5: COSMOS Participants by Ethnicity

	2006 (%)	2007 (%)	2008 (%)	2009 (%)	2010 (%)	2006-2010 (%)
Asian	43.1	46.0	47.4	48.5	55.6	48.1
White	26.7	26.9	24.9	22.1	20.4	24.2
Chicano/Latino	17.3	17.0	17.2	20.4	15.8	17.5
African American	2.8	2.0	2.1	3.5	2.0	2.3
American-Indian	0.6	0.5	0.3	0.0	0.1	0.3
Other	5.9	4.8	4.6	3.2	3.3	4.4
Decline to State/Don't Know	3.7	2.8	3.5	2.2	2.7	2.9

Source: COSMOS enrollment database.
 Note: Percentages may not add to 100 due to rounding.

Display 5: COSMOS Participants by Ethnicity (Continued)



Source: COSMOS enrollment database.

Geographic Diversity of Participants – Display 6 shows the number of participants by each county and by the 11 California County Superintendents Educational Services Association (CCSESA) super regions. (Super regions are comprised of multiple counties in one region and provide the organizational mechanism for county superintendents to work together to implement statewide programs and policies.)

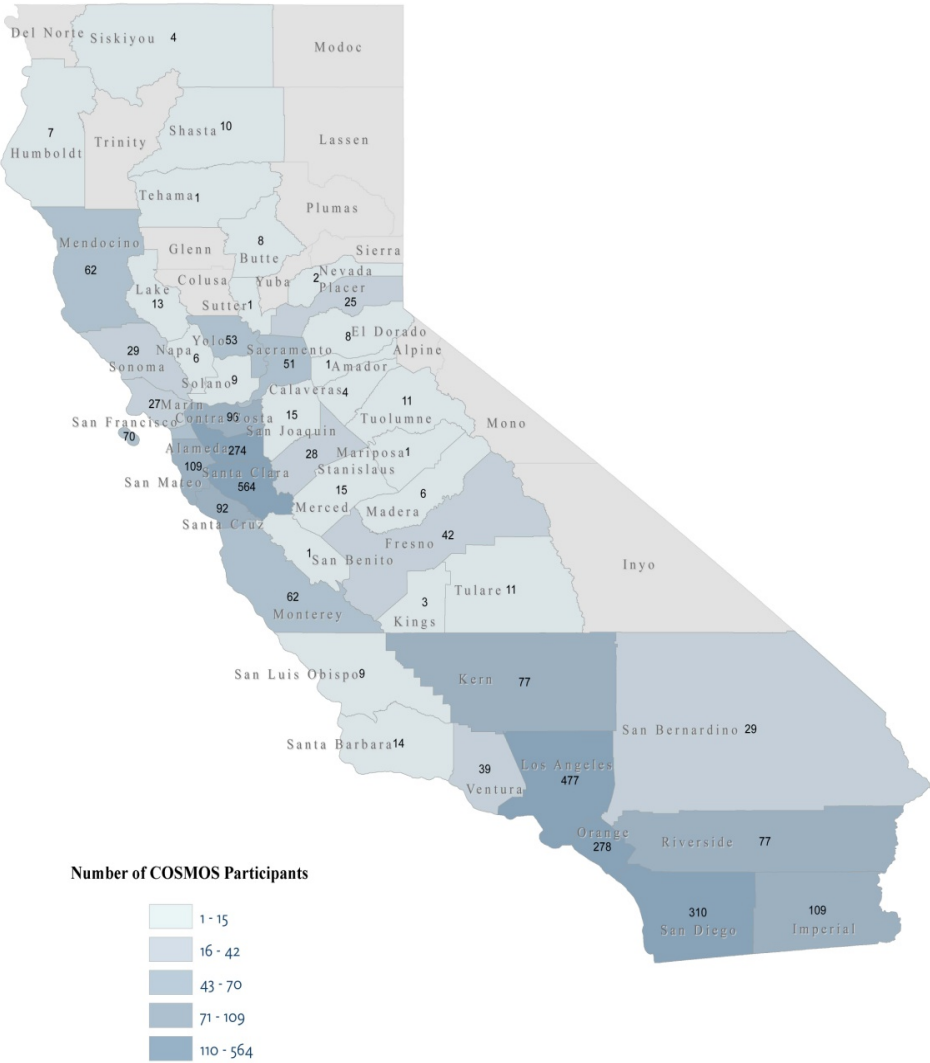
COSMOS participants came from every super region across California, from Region 1 (Humboldt) to Region 9 (San Diego/Imperial Valley). Region 5 (Monterey, San Benito, Santa Clara, Santa Cruz) and Region 9 (Imperial, Orange, San Diego) had the most participants. Over three quarters of California’s counties (45 of 58 or 78%) have had students participate in the COSMOS program during the past five years.

Display 6: COSMOS Participants by County, Summer 2006 through Summer2010

California County Superintendents Educational Services Association (CCSESA) super regions are comprised of multiple counties in one region. The number of COSMOS participants in each county is listed below, along with the super regional totals.

Region	Counties	Total COSMOS Students
Region 1	Humboldt, 7 Lake, 13 Mendocino, 62 Sonoma, 29	111
Region 2	Butte, 8 Shasta, 10 Siskiyou, 4 Tehama, 1	23
Region 3	El Dorado, 8 Placer, 25 Sacramento, 51 Sutter, 1 Yolo, 53	138
Region 4	Alameda, 274 Contra Costa, 96 Marin, 27 Napa, 6 San Francisco, 70 San Mateo, 109 Solano, 9	591
Region 5	Monterey, 62 San Benito, 1 Santa Clara, 564 Santa Cruz, 92	719
Region 6	Amador, 1 Calaveras, 4 San Joaquin, 15 Stanislaus, 28 Tuolumne, 11	59
Region 7	Fresno, 42 Kings, 3 Madera, 6 Mariposa, 1 Merced, 15 Tulare, 11	78
Region 8	Kern, 77 San Luis Obispo, 9 Santa Barbara, 14 Ventura, 39	139
Region 9	Imperial, 109 Orange, 278 San Diego, 310	697
Region 10	Riverside, 77 San Bernardino, 29	106
Region 11	Los Angeles, 477	477

Display 6: COSMOS Participants by County, 2006-2010 (Continued)



Program Funding, Costs, and Financial Aid

COSMOS Funding Sources – In FY 2009-10, UC received \$1.897 million in state funds to fund the summer 2010 COSMOS program, the same amount UC received in FY 2008-09 for the summer 2009 program, but 10% less than the FY 2007-08 state appropriation for the summer 2008 program. The California Education Code specifies that the state fund at least 50%, but not more than 75%, of the program's actual costs. From summer 2006 through 2009, state funding met these criteria.¹

Additional funds are also provided by participants with the ability to pay and from private sources. Over the years UC raised the following amounts of extramural, private funds to support COSMOS: \$790,000 in FY 2006-07; \$1,327,950 in FY 2007-08; \$796,120 in FY 2008-09; \$421,000 in FY 2009-10; and \$583,000 in FY 2010-11.

UC's Program Costs – The average cost per capita to the University to host a student for a four-week COSMOS summer session, including the costs of providing room and board and the costs of instruction, is \$6,500.

Program Affordability – Eligible in-state residents paid a maximum tuition of \$2,550 for the four-week session in summer 2010. (The California Education Code states that tuition for COSMOS may increase by only 5% each year for California residents, which has happened every year.) This sum covered all student costs with the exception of their travel to and from the campus they were attending. Full and partial financial assistance was available. For example, a family of four with a yearly income of \$65,000 would likely have qualified for a full scholarship (\$2,550).

Scholarships are provided as funds are available, and this accounts for the fluctuation in the number of awards provided to students from 2006 through 2010. In summer 2010, there were sufficient funds to provide aid to all students eligible for full financial scholarships. The average scholarship provided in summer 2010 was \$2,343, and a total of \$496,613 in financial aid was provided to 212 COSMOS students. Display 7 shows the total number of COSMOS participants, by year, and the number and percent awarded financial aid. Please see Appendix C for a copy of the summer 2010 COSMOS application packet, which includes the program application and an additional form for families seeking financial aid. The application packet is followed by the summer 2010 criteria (i.e., household size and income) for allocating financial aid. Eligibility for financial assistance and the criteria for allocating full and partial scholarships will remain the same in summer 2011 as they were in summer 2010. (For summers 2006 through 2009, within broad program guidelines, the four campuses hosting COSMOS varied in how they allocated financial aid.)

¹ In summer 2010 State funds contributed 45% of total funding for COSMOS. Although the Legislature intends that at least 50% of COSMOS costs be funded by the State, UC is legally permitted to fund less than 50% of the program costs with State funds. UC is pursuing the removal of these State funding guidelines from the California Education Code.

Out-of-state students, who may be exchange students, for example, pay non-resident tuition of \$6,500 and are not eligible for financial assistance. Over the last five years, only 16 out-of-state students have attended COSMOS.

Display 7: COSMOS Total Participants and Participants Awarded Aid

	Summer 2006	Summer 2007	Summer 2008	Summer 2009	Summer 2010
Total Participants	543	605	627	678	701
Number Awarded Aid	152	215	213	273	212
Percent Awarded Aid	28.0	35.5	34.0	40.3	30.2

Source: COSMOS enrollment database.
 Note: Percentages may not add to 100 due to rounding.

Participants’ Skills Training and Academic Development

In 2010, to assess COSMOS the University of California’s Provost, with the support of the COSMOS Advisory Board, commissioned an expert review panel. (Please see Appendix D for a list of panel reviewers.) The panel observed COSMOS at two of the four campuses, UC Davis and UC Irvine, and provided its final report in August 2010.

Prior to their campus visits, COSMOS course instructors provided the reviewers with the following information: for each course, two to four content learning outcomes, along with indicators that could be observed at different points in time (before the students entered the summer program, towards the end of the program, and after the program concluded). After reviewing this course information, the panel visited the two campuses in the summer of 2010, observed the course clusters, and conducted follow-up discussions with instructors and students.

Participants’ Skills Training – The review panel concluded that COSMOS provides:

- creative project-based learning activities that build strong critical thinking skills that students will carry with them throughout their academic careers;
- a challenging peer environment that breaks intellectual isolation and encourages students to continue to devote themselves to scientific exploration; and
- stimulating opportunities for talented students to use advanced equipment rarely available to high school students, deepening their interest and commitment to STEM fields.

The panel also noted that the COSMOS programs they observed encouraged students to think independently; taught them scientific methods and acquainted them with good

research skills; encouraged collaborative teamwork; and exercised their writing and verbal presentation skills.

COSMOS Alumni’s Academic Development – Of the 3,154 students who have participated in COSMOS from 2006-2010, UC has tracked 2,355 (75% of total COSMOS participants). UC utilizes the National Student Clearinghouse database to track COSMOS students who enroll in any college or university in the United States, including UC campuses (Display 8). UC utilizes UC’s systemwide data to track the majors of COSMOS students enrolled at UC’s undergraduate campuses.

- Using higher education enrollment data from the National Student Clearinghouse UC tracked 2,355 COSMOS graduates (75% of the total COSMOS alumni population from summer 2006 through summer 2010) – all of whom have been admitted to colleges or universities.
- Of the 2,355 COSMOS alumni enrolled in colleges or universities, 2,070 (88%) were enrolled in four-year colleges: 1,297 (55%) enrolled at UC campuses, 622 (26%) enrolled at private universities, and 151 (6%) enrolled at California State University campuses. Another 250 (11%) enrolled in California Community Colleges (two-year programs).
- Among the 1,297 COSMOS alumni who enrolled at UC campuses, 31% enrolled at UC Berkeley, 19% at UC San Diego, 15% at UC Los Angeles, 13% at UC Davis, 9% at UC Irvine, 5% each at UC Santa Cruz and UC Santa Barbara, 2% at UC Riverside, and 1% at UC Merced.
- Of the 1,297 COSMOS alumni enrolled at UC campuses, we were able to obtain information on the majors declared by 1,114 (86%) of them. Of these 1,114 students, two-thirds (66%) have declared STEM majors.
- After UC, the top ten universities at which COSMOS alumni most often enrolled are (1) Stanford, (2) Massachusetts Institute of Technology, (3) University of Southern California, (4) California Polytechnic State University, (5) Harvard, (6) California Institute of Technology, (7) Cornell, (8) Brown, (9) Princeton, and (10) Johns Hopkins.

Display 8: COSMOS Alumni College Destinations

College	Number Enrolled	Percent Enrolled (%)
UC	1,297	55.1
Private four-year	622	26.4
CSU	151	6.4
CCC	250	10.6
Other	35	1.5
Total evaluated	2,355	100.0

Source: National Student Clearinghouse.

References

Goldstein, D. (2008). *Evaluation of the California State Summer School for Mathematics and Science 2000-2008*. Berkeley: Lawrence Hall of Science.

Goldstein, D., & Dorph, R. (2004). *Evaluation of the California State Summer School for Mathematics and Science 2000-2005*. Berkeley: Lawrence Hall of Science.

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University of California, Office of the President (2010). *California State Summer School for Mathematics and Science Program Review Final Report*. Oakland: University of California, Office of the President.

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Appendix A: 2011 Summer COSMOS Course Offerings

UC DAVIS

- Biotechnology
- Physics in Electro-optics & Nuclear Technology
- Introduction to Engineering Mechanics
- Computer Security, Privacy, and Cybervillainy
- Computers in Biophysics & Robotics
- Mathematics
- Biomedical Sciences
- The Chemistry of Life
- Introduction to Astrophysics

UC IRVINE

- Robots To Rockets: Sustainable Energy And Power For Machines
- Astronomy And Astrophysics
- Tissue And Tumor Biology And Mathematical/Computer Modeling
- Life On The Edge: Biodiversity And Ecosystems Of Coastal California
- Mathematical Game Theory
- Psychoacoustics, Math, And Creative Computing
- Biomedical Sciences--Clinical Translational Science
- The World Of Molecules: The Heart Of Chemistry

UC SAN DIEGO

- Computers in Everyday Life
- Engineering Design and Control of Kinetic Sculptures
- Living Oceans and Global Climate Change
- Earthquakes In Action
- Bright Ideas: Light at Work
- Exploring the Cosmos
- Bioengineering/Mechanical Engineering: Red Blood Cell membrane structure.
- The Molecular Biology Revolution

UC SANTA CRUZ

- Logic, Cryptography and Number Theory
- Nanomaterials: Chemistry and Nanotechnology
- Under the Sea - Exploring Marine Organisms and Their World
- Everyday Chemistry: From Perfumes to Pollution
- Video Games: The Design of Fun from Concept to Code
- Chemistry and Mathematics
- Astronomy and Physics
- Marine Mammals and Oceanography
- An Ocean of Data: Marine Science and Statistics


Appendix B: COSMOS Advisory Board Members

Chair: Kenneth L. Hess	Chairman of COSMOS Advisory Board, Founder and President, Science Buddies
Francisco J. Ayala, Ph.D.	Member, National Academy of Sciences, Professor of Ecology and Evolutionary Biology, UC Irvine, 2002 Winner National Medal of Science, 2010 Templeton Prize Recipient
Jeanne Ferrante, Ph.D.	Associate Dean, Jacobs School of Engineering, UC San Diego
Michael B. Gonzales, Ph.D.	Director, Computational Biology, Texas Advanced Computing Center, University of Texas, Austin
Susan Hackwood, Ph.D.	Chair, California Council for Science and Technology, Professor of Electrical Engineering, UC Riverside, Vice Chair of COSMOS Advisory Board
John Hemminger, Ph.D.	Vice Chancellor for Research, Dean, Physical Sciences, UC Irvine
Winston Ko, Ph.D.	Dean, Mathematical and Physical Sciences, UC Davis
Ray Mellado	Founder, Chair and CEO of Great Minds in STEM
Shirley Miranda,	Teacher-Math/Computer Sciences, Morse High School, UC San Diego
C. Bradley Moore, Ph.D.	Professor Emeritus of Chemistry, UC Berkeley
Richard S. Normington	Dean, E-Learning Department Chair and Professor, Sierra Nevada College
Margo Leonetti O'Connell	The Leonetti/O'Connell Family Foundation, Board of Trustees, California Science Center Foundation
Arthur Ramirez, Ph.D.	Dean, Mathematical and Physical Sciences, UC Davis
J. Anthony Tyson, Ph.D.	Professor, Physics, UC Davis
Gayle Wilson	COSMOS Advisory Board Chair Emeritus, Former California First Lady 1991-1999, Board of Directors, Gilead Science, Board of Trustees, California Institute of Technology Board of Directors, Science for Society and the Public (SSP)
F. Sherwood Rowland	COSMOS Advisory Board Emeritus, UC Irvine, Nobel Laureate, Chemistry, 1995, Bren Professor of Chemistry

Appendix C: COSMOS Application and Financial Aid Information

COSMOS 2010

Application Worksheet

This worksheet is intended for use as a guide to the online application. The application must be completed and all supporting documents must be postmarked by 5pm on March 15th. You should compose all your short answer responses in MS Word first and then copy and paste them into the appropriate boxes online, look for the  icons below. Keep this sheet for reference.

CREATE AN ACCOUNT

1. Enter a valid email and password. Please do not use your parent's e-mail address, you can enter a parent email address in the Parent section.
2. A validation email will be sent to your email address. If you do not receive the email, please be sure to check your junk mail and add the necessary e-mails addresses to your list of safe senders in your e-mail account: cosmos@ucop.edu and the campus you are applying to cosmos@ucdavis.edu, cosmos@uci.edu, cosmos@ucsd.edu, or cosmos@ucsc.edu.
3. Keep this email address and password handy. You will need them to check the status of your application and also for use during the program.

Email	Password: must be at least 6 characters

TEACHER RECOMMENDATIONS TAB

Submit the names and e-mail addresses for 2 Math and/or Science teachers. An email with directions will be sent to them. Give them the Teacher Recommendation Worksheet to help them prepare in advance. Ask them for permission in advance and give them sufficient time to complete by the deadline. You can enter the teacher information as soon as you create your account.


Name	E-mail	School	Subject

APPLICATION TAB

Here's a list of items you should have on hand to complete the online application:

- Last 4-digits of your Social Security Number _____
- Statewide Student ID (optional) Each K-12 student in California public schools is assigned a unique statewide ID number by CSIS, the California School Information Services. Your Statewide Student ID number may be printed on your transcript or can be obtained through your school counselor or registrar's office. _____
- School's official name. Example: Henry M. Gunn High School will not be found under Gunn High School. You will only need to manually enter the school name, address, and district if you are home-schooled or are attending a school no located in California. _____
- Overall Weighted GPA (exactly as listed on your transcript, do not round up). If your school does not use weighted GPAs please list your Overall Unweighted GPA, do not calculate a weighted GPA. _____
- Parent or guardian's email address (optional) _____

CAMPUS & CLUSTER SELECTION

1. Select the campus to which you would like to apply. You may only apply to 1 campus.
2. Select a 1st, 2nd, and 3rd choice cluster. (selecting 3 clusters may increase your odds of being accepted)
3. For each cluster: **Elaborate on why you would like to attend that cluster.** (100-250 words per cluster) 

COMPLETE ONLINE AT WWW.UCOPEDU/COSMOS DO NOT MAIL THIS FORM.

STATEMENT OF INTEREST

Please provide a response to ONE of the following: (ONLY 200-300 words)

1. What excites you about math/science, and why would you want to spend a month in COSMOS?
2. Describe a project or experience you worked on that furthered your interest in a specific math/science topic.

EXTRACURRICULAR ACTIVITIES - List any academic related activities first, science fairs, academic clubs/organizations, etc.

Activity	Brief Description of Activity (Note any leadership position)	No. of Yrs	Hrs/Wk	Wks/Yr

FINANCIAL ASSISTANCE - Optional

If applying for Financial Assistance you will need to submit only ONE of the following:

A copy of your verification letter for one of the following:

- Free or Reduced lunch at your school
- Temporary Assistance for Needy Families (TANF)

OR

Your parents must complete and submit the following:

- Financial Assistance Application
- 2009 Federal Taxes
- a brief paragraph describing any extenuating financial circumstances.

Do not complete the Financial Assistance Application.

REVIEW & SUBMIT

Your online application is not complete until you have reviewed and clicked the 'Submit the Completed Application' button and you see a Confirmation page, a copy will also be e-mailed to you. You will need to sign and return only the Signature Section.

COSMOS - UC Davis
1204 Mathematics & Science Bldg.
One Shields Avenue
Davis, CA 95616
Email: cosmos@ucdavis.edu
Phone: (530) 754-7326

COSMOS - UC Irvine
493 Social Science Tower
Irvine, CA 92697-2505
E-mail: cosmos@uci.edu
Phone: (949) 824-1908

COSMOS - UC Santa Cruz
2901 Mission Street Ext., Ste A
Santa Cruz, CA 95060
Email: cosmos@ucsc.edu
Phone: (831) 459-1763

COSMOS - UC San Diego
9500 Gilman Drive #0429
Engineering Building Unit 1, Suite 1400
La Jolla, CA 92093-0429
E-mail: cosmos@ucsd.edu
Phone: (858) 822-4361

5 KEYS TO A SUCCESSFUL APPLICATION

1. Turn in all your materials by 5pm on March 15th, this includes the application fee, transcripts, Star test scores (UCD Only), Financial Assistance application or verification letter, signed confirmation page, and both teacher recommendations.
2. Invest time and effort into your essays. Most applicants are fantastic students. Tell us why *you* should be admitted. What sets *you* apart?
3. Have someone check your Short Answer Responses for spelling and grammatical errors. Do not use SMS abbreviations.
4. Teacher Recommendations are very important. Give your teachers enough time to complete and submit; remind them of the deadline. You should give them the Teacher Recommendation Worksheet so that they prepare ahead of time.
5. Please take a look at our Frequently Asked Questions page for a better understanding of our program.

COMPLETE ONLINE AT WWW.UCOPEDU/COSMOS DO NOT MAIL THIS FORM.

COSMOS 2010

Teacher Recommendation Worksheet

STUDENT- Fill in this top section.

First Name	Last Name	Is applying to COSMOS at: <input type="checkbox"/> UCD <input type="checkbox"/> UCI <input type="checkbox"/> UCSC <input type="checkbox"/> UCSD
This was your teacher for what subject(s)?		What grade(s) were you in at the time? <input type="checkbox"/> 8th <input type="checkbox"/> 9th <input type="checkbox"/> 10th <input type="checkbox"/> 11th <input type="checkbox"/> 12th

DEAR TEACHER:

This student has listed you as one of their math/science teacher recommenders. You will receive an email from cosmos@ucop.edu with a personal link to the online form, occasionally our email is marked as SPAM, please be sure to check your junkmail folder. Please be aware that the deadline is 5pm on March 15th. If you will not be able to meet this deadline, or do not feel comfortable recommending this student, please notify them so that they may ask someone else for a recommendation.

CLASSROOM PERFORMANCE

- *In your opinion, does this candidate have a serious interest in studying math or science?* Yes No
- *In your opinion, does this candidate have a clear aptitude for studying math or science?* Yes No
- *Describe the candidate's typical classroom performance and preparation and willingness to work.*
- *How would you characterize the candidate's enthusiasm and interest in math or science?*
- *You may also address any obstacles this student has overcome in pursuing his or her educational goals. Please provide any additional information that the Student Review Committee should consider when evaluating this candidate for COSMOS. (optional)*

PERSONAL QUALITIES

	Outstanding	Good	Average	Below Average	No Basis for Judgment
Motivation & meeting deadlines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Independence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadership	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social Maturity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acceptance of challenge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall I rank this student's academic performance in relation to his/her peers in the:

- Upper 1-2% Top 5% Top 10% Top 25% Top 50% Bottom 50%

DO NOT MAIL THIS FORM

COSMOS 2010

Teacher Recommendation Worksheet

STUDENT- Fill in this top section.

First Name	Last Name	Is applying to COSMOS at: <input type="checkbox"/> UCD <input type="checkbox"/> UCI <input type="checkbox"/> UCSC <input type="checkbox"/> UCSD
This was your teacher for what subject(s)?		What grade(s) were you in at the time? <input type="checkbox"/> 8th <input type="checkbox"/> 9th <input type="checkbox"/> 10th <input type="checkbox"/> 11th <input type="checkbox"/> 12th

DEAR TEACHER:

This student has listed you as one of their math/science teacher recommenders. You will receive an email from cosmos@ucop.edu with a personal link to the online form, occasionally our email is marked as SPAM, please be sure to check your junkmail folder. Please be aware that the deadline is 5pm on March 15th. If you will not be able to meet this deadline, or do not feel comfortable recommending this student, please notify them so that they may ask someone else for a recommendation.

CLASSROOM PERFORMANCE

- In your opinion, does this candidate have a serious interest in studying math or science? Yes No
- In your opinion, does this candidate have a clear aptitude for studying math or science? Yes No
- Describe the candidate's typical classroom performance and preparation and willingness to work.
- How would you characterize the candidate's enthusiasm and interest in math or science?
- You may also address any obstacles this student has overcome in pursuing his or her educational goals. Please provide any additional information that the Student Review Committee should consider when evaluating this candidate for COSMOS. (optional)

PERSONAL QUALITIES

	Outstanding	Good	Average	Below Average	No Basis for Judgment
Motivation & meeting deadlines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Independence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leadership	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social Maturity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acceptance of challenge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall I rank this student's academic performance in relation to his/her peers in the:

- Upper 1-2%
 Top 5%
 Top 10%
 Top 25%
 Top 50%
 Bottom 50%

DO NOT MAIL THIS FORM

COSMOS 2010

Financial Assistance Application

This form should be completed by a parent/guardian. You will need information from your income taxes.

Submit only if you wish to be considered for COSMOS financial assistance. Requesting financial assistance will not affect the outcome of your child's COSMOS application. Financial assistance is restricted to California students only. Preference for financial assistance will be given to first-time attendees, but all California students will be considered. DEADLINE: March 15th

STUDENT INFORMATION

First Name	Last Name
------------	-----------

PARENT/GUARDIAN INFORMATION

First Name	Last Name		
Mailing Address	City	State	Zip Code
Phone ()	E-mail	Are you the: <input type="checkbox"/> Parent <input type="checkbox"/> Guardian	

PARENTS ADJUSTED GROSS INCOME (AGI)

2009 forms: 1040 - Line 37; 1040A - Line 21; 1040EZ - Line 4	\$
Earned by Father/Guardian \$	
Earned by Mother/Guardian \$	

ANNUAL SOCIAL SECURITY OR DISABILITY BENEFITS

Report benefits received by the entire family. Omit educational benefits. Do no report money included in AGI above. . . \$

NON-TAXABLE INCOME

Include any: <ul style="list-style-type: none"> • Untaxed unemployment compensation • Interest and dividend exclusions • Military, or clergy housing allowances • Untaxed portion of capital gains 	<ul style="list-style-type: none"> • Income from untaxed municipal bonds • Child support • Non-taxable retirement payouts • Non-educational veterans' benefits 	\$
TOTAL		\$

Size of Household
 Include parents, all dependent children, and other dependents who you claim. _____

Number of dependents who will be full-time college students in the fall _____

Un-Reimbursed Medical Expenses
 Only report if your amount of un-reimbursed expenses is greater than 7.5% of your AGI above. \$ _____

- In order to complete this financial aid application you must submit:
1. A copy of 2009 Federal tax forms (please do not include schedules and black out all Social Security Numbers) . You may submit an older tax form as an estimate but a final decision will not be made until you submit the current year's tax forms. If you will not file tax forms, please provide appropriate income documentation.
 2. A brief paragraph written by parent/guardian describing any extenuating financial circumstances. ✍
 3. Documentation verifying Social Security benefits, if applicable.
 4. Documentation verifying un-reimbursed Medical Expenses, if applicable.

I certify that the information reported on this form is accurate to the best of my knowledge.

_____ Parent/Guardian Signature	_____ Date
------------------------------------	---------------

COSMOS 2010

Solicitud de Ayuda Financiera

Este formulario debe ser completado por uno de los padres o el guardián. Necesitará información de sus impuestos.

Envíela sólo si desea ser considerado para recibir una ayuda financiera de COSMOS. La solicitud de ayuda financiera no afectará el resultado de la solicitud COSMOS de su hijo. La ayuda financiera se ofrece sólo a los estudiantes que viven en California. Para la ayuda financiera se le dará preferencia a los que asistan por primera vez, pero serán considerados todos los estudiantes de California.
FECHA LÍMITE- 15 de marzo

INFORMACIÓN DEL ESTUDIANTE

Nombre	Apellido
--------	----------

INFORMACIÓN DEL PADRE/GUARDIÁN

Nombre	Apellido		
Dirección postal	Ciudad	Estado	Código postal
Teléfono ()	E-mail	Usted es: <input type="checkbox"/> Padre <input type="checkbox"/> Guardián	

INGRESO BRUTO CORREGIDO (AGI) DE LOS PADRES

Formularios 2009: 1040 - línea 37; 1040A - línea 21; 1040EZ - línea 4

INGRESOS

	\$
Ganados por el padre/guardián \$	
Ganados por la madre/guardián \$	
BENEFICIOS ANUALES DE SEGURO SOCIAL O POR DISCAPACIDAD Informe los beneficios recibidos por toda la familia. No incluya los beneficios para educación. No informe el dinero incluido en el AGI anteriormente	\$
INGRESOS LIBRES DE IMPUESTOS incluya todos:	\$
<ul style="list-style-type: none">• Compensaciones por desempleo libres de impuestos• Intereses y exclusiones de dividendos• Asignación para vivienda militar o eclesiástica• Porción libre de impuestos de ganancias de capital• Ingresos por bonos municipales libres de impuestos• Pensión alimenticia para menores• Pagos de jubilación libres de impuestos• Beneficios no educacionales para veteranos	
TOTAL	\$

Tamaño de la familia

Incluya los padres, todos los hijos dependientes y otros dependientes a su cargo

Número de dependientes que serán estudiantes universitarios de tiempo completo en otoño

Gastos médicos no reembolsados

Sólo infórmenos si el monto de los gastos no reembolsados es superior al 7.5% de su AGI mencionado anteriormente

Para completar esta solicitud de ayuda financiera debe enviar:

- Una copia de los formularios de declaración de impuestos federales de 2009 (no incluya programa de pagos y porfavor apagón los numeros de seguro social). Puede enviar un formulario de declaración de impuestos anterior, pero no se tomará una decisión definitiva hasta que no envíe los formularios del presente año. Si no desea llenar formularios de impuestos, proporcione la documentación adecuada de sus ingresos.
- Una breve frase escrito por uno de los padres or el guardián que describa todas las circunstancias financieras atenuantes.
- Documentación que verifique los beneficios de Seguro Social, si corresponde.
- Documentación que verifique los gastos médicos no reembolsables, si corresponde.

Certifico que, según mi leal saber y entender, la información presentada en este formulario es exacta.

Firma del Padre/Guardián

Fecha

COSMOS Financial Assistance Matrix - Summer 2010

Tuition: \$2,550

Scholarship Levels:

Full scholarship amount:	\$2,550
3/4 scholarship amount:	\$1,913
Half scholarship amount:	\$1,275
1/4 scholarship amount:	\$638

Family Status/Income	Eligibility by Household Size				
	2	3	4	5	6+
Free/Reduced Lunch					
<\$40K					
\$40,001 - \$45,000					
\$45,001 - \$50,000					
\$50,001 - \$55,000					
\$55,001 - \$60,000					
\$60,001 - \$65,000					
\$65,001 - \$70,000					
\$70,001 - \$75,000					
\$75,001 - \$80,000					
\$80,001 - \$85,000					
\$85,001 - \$90,000					
\$90,001 - \$95,000					
\$95,001 - \$100,000					

Appendix D: COSMOS Review Panel Members (2010)

The review panel members included UC faculty and experts in K-12 curriculum development, from a range of disciplines including engineering, biology, and chemistry.

Susan Lord

Susan Lord is Coordinator and Professor of Optoelectronics Laboratory at the University of California, San Diego. Her research interests are in the areas of optoelectronics and materials. She has worked as a Research Fellow at SPAWAR Systems Center's RF Photonics Branch. Most recently, her research has been supported by NSF, NASA, the Office of Naval Research, and the American Society of Engineering Educators. Professor Lord received her Ph.D. from Stanford University.

Jennifer Mullin

Jennifer Mullin is Senior Engineering Instructor at High Tech High in San Diego. An expert in project-based learning, Dr. Mullin's area of research is in the investigation of student and team creativity on introductory engineering design. Dr. Mullin received her Ph.D. in Engineering Education from Virginia Tech.

James Postma

James Postma is Professor of Chemistry at California State University, Chico. Professor Postma is the co-author of Chemistry in the Laboratory, a widely used laboratory text for freshman general chemistry courses. He has been a representative to the California Science Project (California Subject Matter Projects). He is also actively involved in the California State Chico Academic Senate, serving the Senate as secretary and chair of the Educational Policies and Procedures Committee, as secretary of the Senate, and as chair of the Faculty and Student Policies Committee. Professor Postma received his Ph.D. in Physical Chemistry from the University of California, Davis.

Norbert Reich

Norbert Reich is Professor of Biological Chemistry at the University of California, Santa Barbara. Currently, Professor Reich is studying enzyme function, primarily at the levels of catalytic and specificity mechanisms, with a long-term goal of developing enzyme inhibitors with potential therapeutic application. Awards include a Regent's Junior Faculty Fellowship, an American Cancer Society Faculty Research Award, and the UC President's Award for Excellence in Undergraduate Research. Professor Reich received his Ph.D. from the University of California, San Francisco.

Contact information:

UCOP Budget and Capital Resources
1111 Franklin Street, 6th Flr.
Oakland, CA 94607-5220
Office website: <http://budget.ucop.edu>
Report website: <http://budget.ucop.edu/legreports/>