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The **Teachers + Occidental = Partnership in Science** (TOPS) program consists of a number of science outreach programs planned and directed by its teacher participants and Occidental College. The program has had an influence in changing school culture by facilitating interactions that motivates school administrators reexamine and reaffirm the value of broadly offering high-level lab-based activities to students in all levels of science courses. Evidence for this includes retention of five of the original schools with (several generations of TOPS teachers) that continue to participate in the program since its founding in 1992.

TOPS' long-range goal is to increase interest and achievement in science among K – 12 students by:

- providing secondary students and educators access to advanced scientific instrumentation for standards-based hands-on laboratory experiences in biology, chemistry, and physics.
- increasing science educators' self-perception as professionals and scientists
- improving the teaching of laboratory concepts
- supporting science educators' efforts to improve instruction at their local schools

TOPS has established a reputation for outstanding support for teachers as they introduce advanced scientific instrumentation into their classrooms. Approximately 60% of the teachers who have attended one of the TOPS Summer workshops continue to participate in the program. During the 2008 – 09 school year over 7000 students at twenty schools in the greater Los Angeles region participated in at least two TOPS labs in one of the three disciplines. Of these 7000 students over 40% were underrepresented minorities and nearly 50% were female.

Our highly successful biology, physics, and chemistry staff development workshops provide training and access to modern laboratory equipment to support a series of over 20 laboratory experiments appropriate to high school science courses (e.g. life science, physical science, biology, chemistry, AP, and honors courses).

In 2010 – 2011 TOPS is introducing labs on thermodynamics (chemistry & physics) and biotechnology (biology).

### **TOPS Training & Program Details**

#### Phase I: Staff Development Workshop

This is a one-week professional development program to familiarize teachers with the concepts, equipment, procedure, and curriculum integration of a series of labs. Recognizing the need for interdisciplinary materials at the high school level, TOPS developed these labs to extend or replace labs typically done in high school, but with a biochemistry emphasis and a technological approach. **Fee: \$990**

#### Phase II: Van Visits - Co-Facilitated Laboratory Activities

Recognizing that a one-week workshop is insufficient to build confidence with new equipment and an obligation to maintain the equipment for continued use by all TOPS participants, the TOPS program provides mentored access to technological equipment with van visits. These visits will enable the trained teacher to carry out three of the TOPS labs with their students, with the assistance of an experienced high school resource teacher. **Fee: \$1300**

#### Phase III: Lending Kits

After the first year of mentored participation, the TOPS program makes available a lending kit, which provides the specialized equipment and hard to obtain chemicals for each of the labs. Up to five of these kits may be scheduled per year, supplied for up to five classes. These are scheduled with the TOPS staff, delivered to the classroom, and remain for approximately one week for student use. The TOPS resource teacher remains available for assistance and consultation, but is not in the classroom on a regular basis. **Yearly subscription fee: \$700**