Building Classroom and Organizational Structure
Around Positive Cultural Values

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What is Compass?
The Compass Project is a self-formed group of graduate and undergraduate students in the physical sciences at UC Berkeley. Our goals are to improve undergraduate physics education, provide our members with opportunities for professional development, and increase retention of students, especially those from populations typically underrepresented in the physical sciences. Compass fosters a diverse, collaborative student community by providing a wide range of services, including a summer program, fall and spring semester courses, mentoring, a research lecture series, and other academic and social support.

Demographics: Compass vs. Department
Compass summer program 2008-2011 students (N = 62) vs. Berkeley physics department average

<table>
<thead>
<tr>
<th>Summer Program (%)</th>
<th>Berkeley Physics (%)</th>
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</thead>
<tbody>
<tr>
<td>Female</td>
<td>47</td>
</tr>
<tr>
<td>Chicano/Latino</td>
<td>21</td>
</tr>
<tr>
<td>African American</td>
<td>5</td>
</tr>
<tr>
<td>Native American</td>
<td>3</td>
</tr>
<tr>
<td>First-generation</td>
<td>26</td>
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</tbody>
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Compass Membership, 2011/12

Supporting the Whole Person
Support both in the classroom and organization

Academic
- Explore and develop physical models
- Collect and interpret scientific data
- Practice metacognitive reflection

Personal
- Meet with mentors twice a month
- Interpret and make use of grades
- Perform weekly self-evaluations

Professional
- Present results in posters and talks
- Write grants to secure funding
- Coordinate summer program

Social
- Build strong friendships with peers
- Participate in leadership retreats
- Attend social events

Learning from Experience
Iteration in the spring semester course
Students measured the thermal expansion of a wire. They used their characterization of the measurement error to improve the apparatus, data collection, and analysis procedure.

1. Collect data
2. Quantify uncertainty
3. Improve experiment

Iteration in the summer program design

How often did you see 2010 Compass students over the course of last year?

In what ways?

Live with or plan to live with other Compass students

Study with other Compass students

After your first year as a Cal and Compass student, what (if anything) is important for you about Compass?

"Compass has given me a community of fellow students and graduate students who I can go to whether I need help with my homework or just someone to talk to. Having Compass and its community as a first year student at a large university helped me find my way and transition to Cal."

"I love the sense of community and belonging Compass offers. I always feel included in any activity and the people are very approachable. Compass has become a family for me and a support system I can count on for guidance and help."

In fall 2011, an online survey was administered to the 17 students who participated in the 2010 summer program and the subsequent fall 2010 course; 15 of them responded. This group of students did not take a spring course because it was not offered that year.

Survey Data

Fall semester course final projects
Each student asks a question that he or she finds interesting.
To answer their questions, students develop models by talking with peers, consulting the literature, and conducting experiments. Graduate student research advisors help guide this process.

Students present their work through final papers and presentations.

Undergrad representation in leadership

Undergrad leadership examples
- Spring course co-designer and co-teacher
- Summer program logistical coordinator
- PER researcher

Composition of Compass, 2011/12

Alumni: 10%
Grads: 37%
Seniors: 15%
Juniors: 15%
Sophomores: 16%
Freshmen: 19%
Community: 21%
Organizers: 10%