Pioneers in Engineering
Sponsorship Packet

2022-2023

Pioneers in Engineering

ABOUT US

Pioneers in Engineering (PiE) is a student run organization at UC Berkeley dedicated to STEM outreach in the Bay Area through a mentorship process. PiE consists of nearly 100 volunteer undergrad students who design a robotics kit and annual competition for nearly 300 students in the underserved communities around Berkeley.

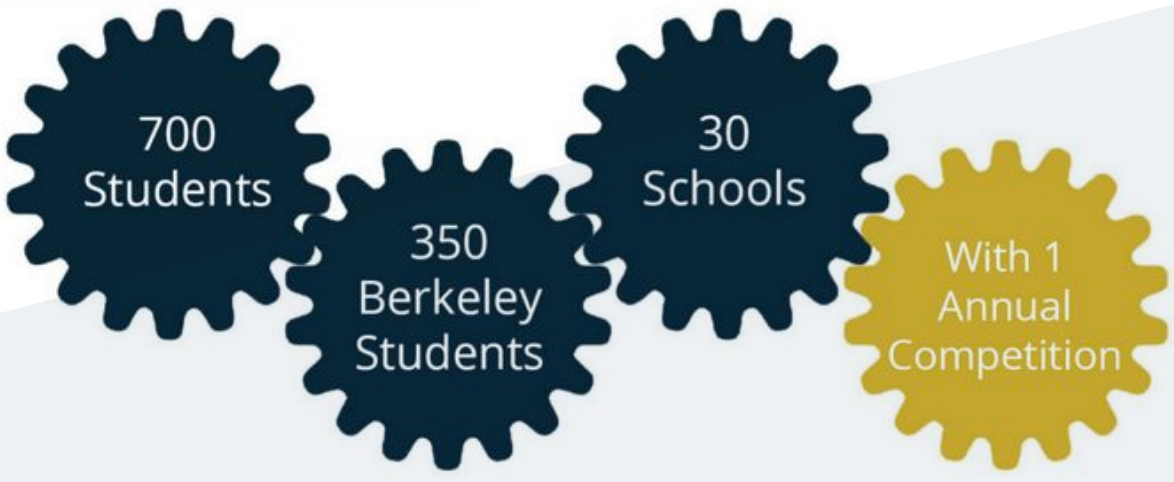
The student organization is supported by the Pioneers in Engineering Foundation, a 501(c)(3) tax-exempt non-profit, whose mission is to promote STEM education.

We believe that no student should be denied to a quality STEM education.

Because the cost of entry in other competitions is an unfair barrier, we have made it our goal to provide students who cannot afford these opportunities a way to thrive.

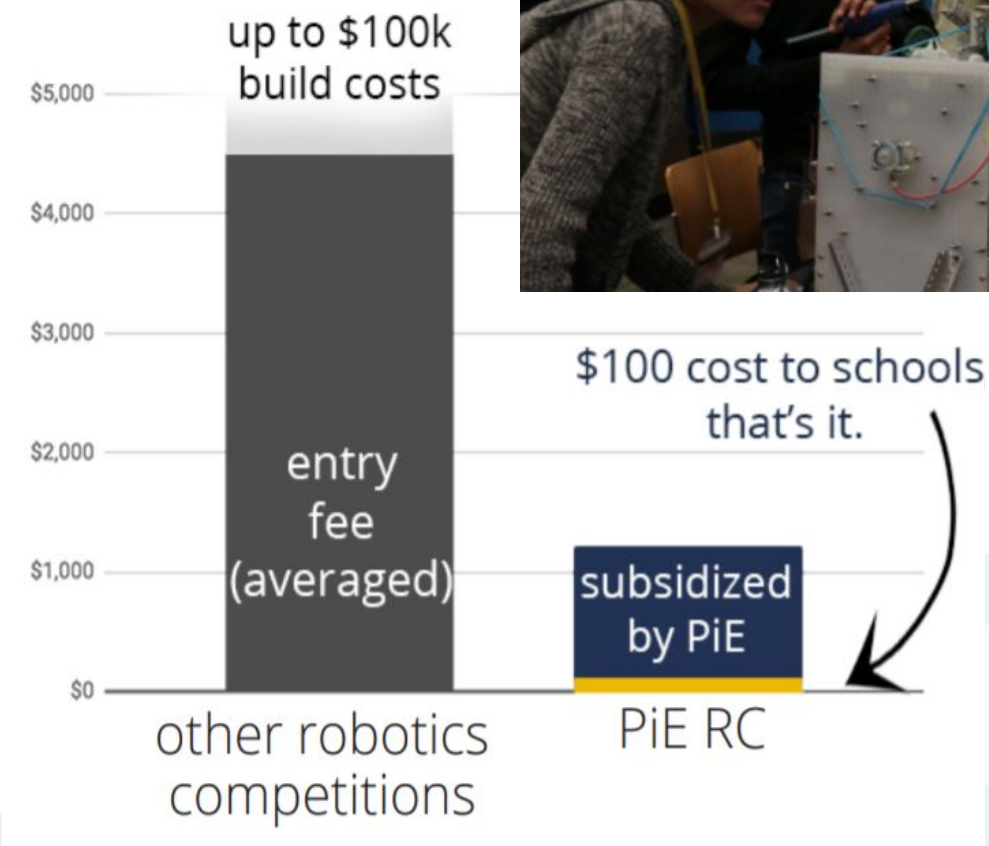
Our robotics competition provides students an exciting challenge that fosters teamwork and collaboration in schools where there are often few courses and programs that expose students to either higher education or potential STEM careers.

In the past 14 years we have impacted...



Our Program

Our staff works to make robotics opportunities accessible by creating the competition ourselves from scratch. We conceive the game rules, game field, and code of the software needed for the competition. We also develop workshops and panels technical topics such as mechanical design and programming to team organization, leadership, and college. We run an on-campus class to recruit 20+ other UC Berkeley students as mentors and teach them their duties to ensure our students have the smoothest mentorship experience possible.



Our Students

WHO WE SUPPORT

Our efforts center on enabling underrepresented students, especially in lower income areas, to learn more about STEM through mentorship and friendly competitions. Many of our students lack the educational and financial means to access opportunities in STEM at their schools, let alone to pursue higher education in these areas. This translates into an underrepresentation of these students, who are usually first-generation, low-income, and students of color, in one of the fastest growing fields.

BY THE NUMBERS

72%

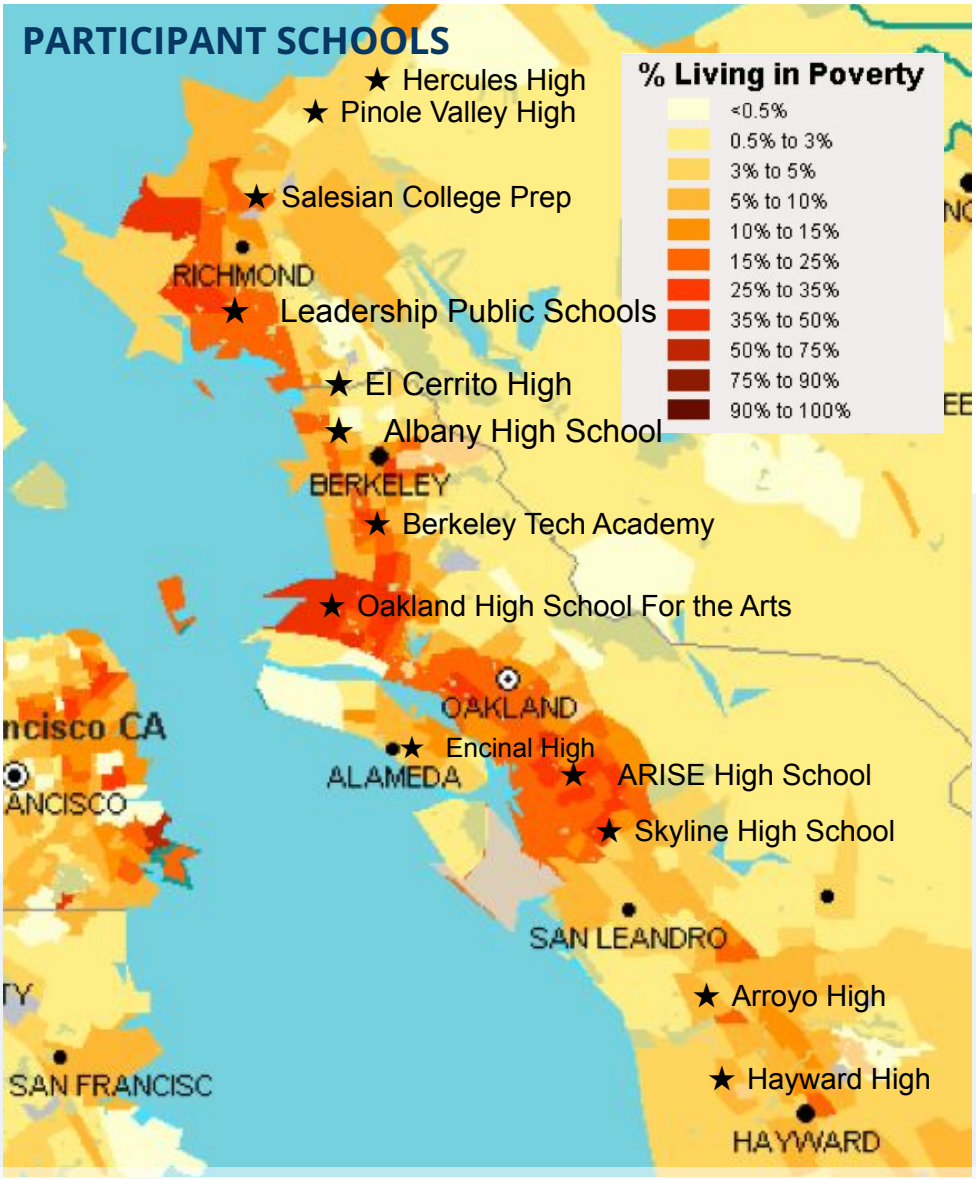
Of our students are historically underrepresented*

77%

Of our students have not been taught CS in classes

62%

Of our students believe their school doesn't provide a supportive environment for STEM education



*Underrepresented groups in tech include Hispanic/Latino, African American/black, Native American, females, and low-income groups

Map from Visual Economics (http://visualizingeconomics.com/blog/2007/10/14/san-francisco-oakland-poverty-map)

Our Impact

79%

Of our students became more interested in STEM after PiE

76%

Of our students gained a better direction of what to pursue in college after PiE

69%

Of our students became more interested in pursuing higher education after PiE

Our Staff

Software Teams

Our staff of 76 is divided into 5 teams with different focuses. One group creates an IDE for participants by creating a friendly UI and a back-end that can communicate with the robot. The Runtime team works on firmware to establish communication between the robot's controller, student code, competition field, and other devices. Staff also writes software to manage the field and use sensors to update scoring, matches, and timing autonomously. Another team automates the process of installing our firmware onto the students' Raspberry Pi's, as well as conducting thorough testing. Finally, we have some staff working on web development to maintain the website.

Electrical Teams

Our 2 electrical teams of 15 focus on creating electrical components needed for students to build the robot, such as motor controllers, various sensors, and the power distribution board. Staff learns about creating PCB designs with Eagle, writing firmware, and producing boards with surface mount soldering and reflow ovens.

Mechanical Teams

We have one mechanical team of 15 that focuses on designing and manufacturing parts for the robot kits. Staff learns to use SolidWorks, Fusion 360, CAD, and even machine shop tools.

Business Teams

We have one business team of 13 that focuses on data analysis using Jupyter Notebook, corporate relations, staff retention, and branding of the organization.

Education Teams

We have one education team of 10 that focuses on overseeing a curriculum for the competition that will keep students engaged and leading a class to prepare UC Berkeley students for mentoring. Staff administers and plans other projects such as PRB and Trebuchet

Below are a few companies where our past staff have been employed

Microsoft

amazon

Dropbox

lyft

Google

yelp

airbnb

Texas Instruments

JPL

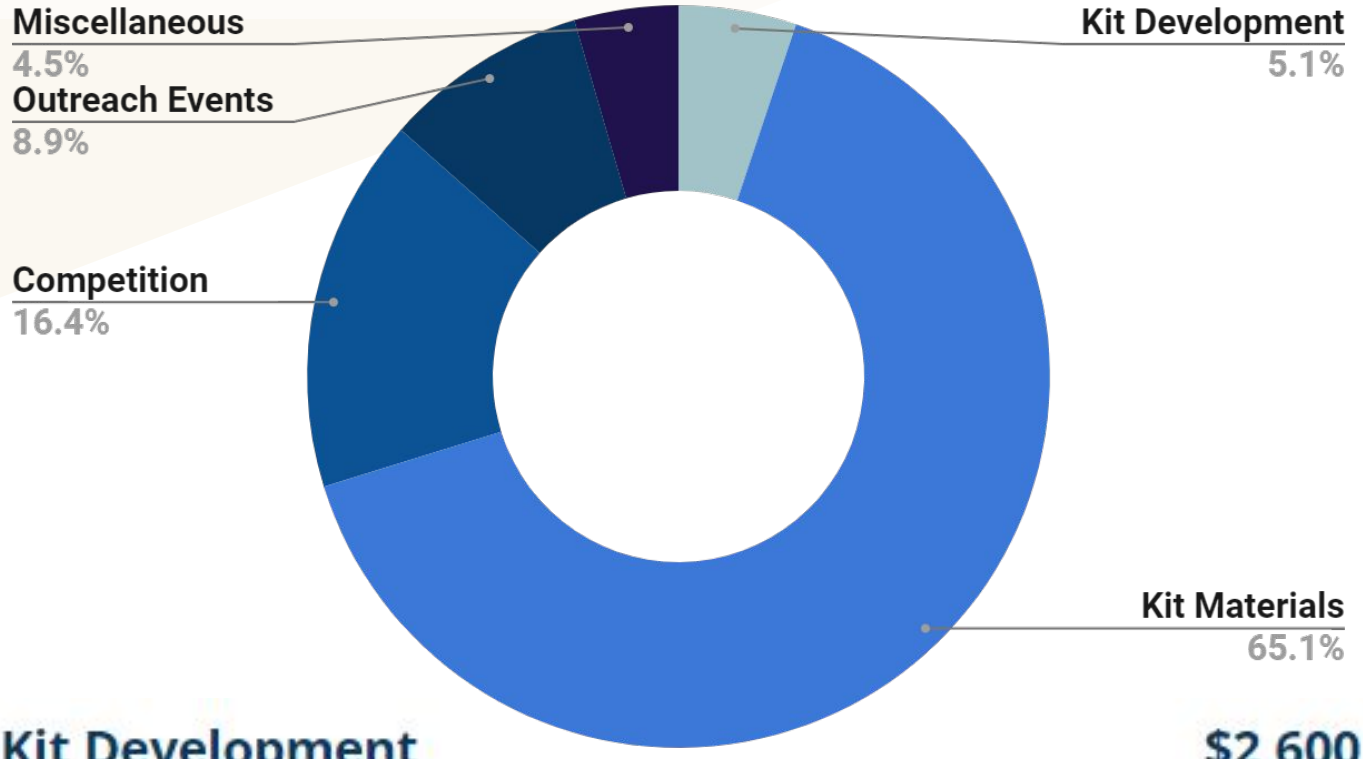
Jet Propulsion Laboratory
California Institute of Technology

GM

McKESSON

Our Budget

Our staff is dedicated to reducing the cost of the engineering competitions for students, so only 5% of our budget is used for operational overhead and 95% of our budget directly serves PiE students as outlined below.



Kit Development Designing and prototyping robotics kits	**$2,600**
Kit Materials Mechanical and electrical components and manufacturing	**$33,000**
Robotics Competition Venue fees and the game field	**$8,300**
Outreach Events Materials for workshops, lessons, and transportation costs	**$4,515**
Miscellaneous Printing, staff recruitment, operating expenses	**$2,300**
	$50,715

Sponsorship Tiers

Benefits	**Any Amount** ($0-$500)	**Bronze** ($500-$720)	**Silver** ($720-$1000)	**Gold** ($1600)	**Title** ($10,000+)
Tax-deductible donation	●	●	●	●	●
Name on PiE website	●	●	●	●	●
Logo on banners		●	●	●	●
1 *internal* info-session event*		●	●	●	●
1 *external* info-session event**			●	●	●
Access to PiE resume book			●	●	●
2 *external* info-session events**				●	●
Logo displayed on field parameter				●	●
Competition award named after company					●
Company name as Title Sponsor on PiE Alumni Scholarship					●

**internal* info-session allows your company to present to all PiE staff members during our general member meetings

***external* info-sessions include provided food, a room, heavy and inclusive marketing to students across campus, and parking passes

Details on More Projects

The PiE Alumni Scholarship

The PiE scholarship Committee awards a total of $2400 to high school seniors. A $2000 award is given to one winner while four finalists are awarded with $100. Winners are chosen by an alumni panel who use a holistic approach including need, passion towards their interests, and the essays and interviews in their application.

PiE on the Road in a Box (PRB)

Beyond our spring robotics competition, we teach workshops in the fall that focus on hands-on engineering topics, such as gear ratios, kinematics, and circuits. Called PiE on the Road, we travel to the high schools and give them custom-designed, mini robot kits to supplement the material we teach, leaving the kits with the students afterwards so that they continue exploring and designing even after lessons end.

Fall Competition

We host a reboot of last spring's robotics competition during the fall, where we invite schools who have previously participated to compete for a weekend to play the same game that they played in the spring, with improved robot design and strategy. Fall Competition is also a chance for schools to recruit to new students and prepare them for the main competition during the spring semester.

Trebuchet

An event at the Lawrence Hall of Science where we launch pumpkins with a trebuchet to create interest in engineering for younger students.

Thank you for your time!

For questions, please email either:

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leadership@pioneers.berkeley.edu