# Overview

## About:
We are preparing high school teachers to teach the **Beauty and Joy of Computing** curriculum through six-week summer workshops with a one-week followup the next summer.

## Institution
- University of California, Berkeley
- North Carolina State University, Raleigh

## PI/Leader:
- Daniel Garcia, UCB
- Brian Harvey, UCB
- Tiffany Barnes, NCSU

## Age of Program:
2 years

## Location:
CA, NC, NJ, MA, PR

## School Districts:
Various

## Teachers Served

<table>
<thead>
<tr>
<th>Served:</th>
<th>Dosage:</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>~15 * 4 = 60</td>
<td>80 hours face-to-face, 160 hours online; 80 hours f2f followup f2f planned</td>
<td>In-service; CS, math, science, business, technology</td>
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</tbody>
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## Grade(s):
9-12

## Program Budget

<table>
<thead>
<tr>
<th>Sources:</th>
<th>Budget:</th>
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<tbody>
<tr>
<td>NSF CE21</td>
<td>$333,333/yr</td>
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Learning Goals

Participants will be prepared to teach the BJC course:

• Understand context, Big Ideas, Computational Thinking Practices of CS Principles
• Familiar with all course materials (online)
• Ready to lead discussion of social context
• Comfortable with Snap! Programming
  - Incl. recursion & higher-order functions (abstraction)
• Map/transfer the course to their local HS conditions
• Participate in BJC teachers Learning Community
**PD Structure**

PD format: Six summer weeks, first and last face to face, weeks 2-5 online with weekly Skype discussion meetings. Monthly checkin Skype meetings during the school year. One week face-to-face the following summer, focusing on reflection and sharing best practices of pedagogic content knowledge.

Team: 3 faculty (Dan Garcia and Brian Harvey, UCB; Tiffany Barnes, NCSU); currently ~5 BJC-experienced high school teachers (Josh Paley, Sean Morris, Ray Pedersen, Nathan Maddix, Leslie Keller); Researchers (Nathaniel Titterton, Kathleen Haynie); Developer (Jens Mö nig)

Participants: ~60 high school teachers in CA, NC, NJ, MA, PR.
Successes and Challenges

**Successes:**

*Blown to Bits* textbook;
Snap! visual programming language, visual metaphors for CS ideas;
Teacher & student enthusiasm.

**Challenges:**

Administrative obstacles to getting the course actually taught in HS;
Pace of 4-week online component is challenging for teachers;
More scaffolding needed.
Measures of Success

• Teachers feel confident and ready to teach
• Teachers feel they have all resources they need
• Students are excited by & successful in course
• Number of women and underrepresented minorities are significant, $\geq$ % at their school
• Students passing the AP exam (when it’s ready)
Testimonial

• (during course) “First of all, the Beauty and Joy of Computing totally rocks! We are having a blast this year and it is only going to get better from here. The students love it and their projects are amazing. This may be the best course ever invented. I added some new projects at the beginning of the year to ease high school students into the process, but I am sure they are going to do fine on all of the curriculum.”

• (after first year, before 2nd year) “We already have double the enrollment for our AP class - it is full and overflowing. The reason that I saw the list this early is the assistant principal was telling me it was time to cut it off because it was already too full. We also have five times more girls than this year, and we smashed our enrollment record for girls. We retained all of the BJC girls. Girls almost always are one and done at PHS.”
Higher order functions are easy!