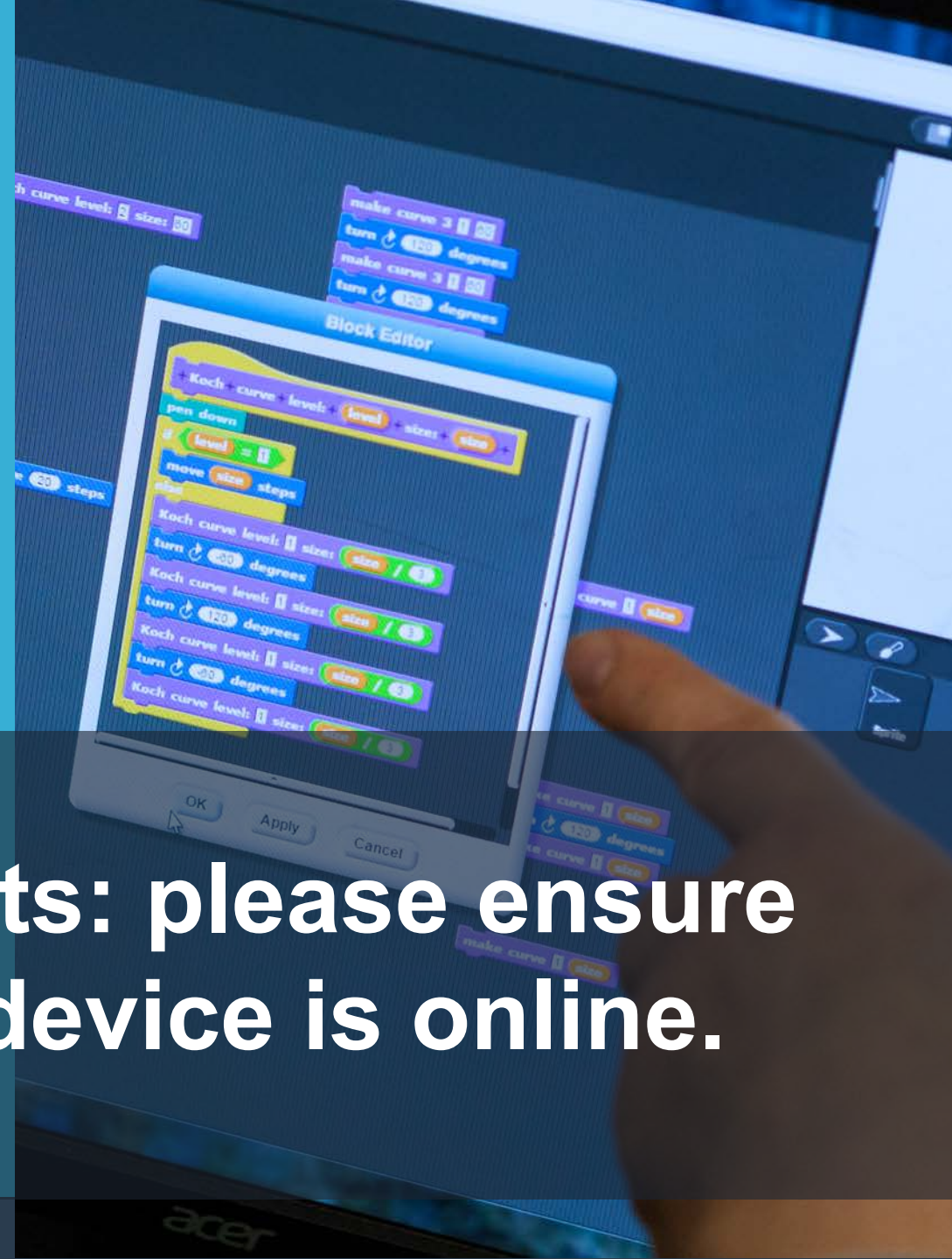**EDC**

**Education
Development
Center**

BEAUTY AND JOY OF COMPUTING

A CS Principles Course

Mary Fries

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Participants: please ensure that your device is online.

BJC Overview

Beauty and Joy of Computing (BJC), is a College Board endorsed AP CS Principles high school course committed to increasing participation of girls and underrepresented minorities in computer science. Originally designed at UC Berkeley as the introductory course for non-CS majors, BJC has been adapted in this project as a course for high school AP use.

BJC is funded by National Science Foundation

2300+ BJC students in NYC in 2017-18

4400+ BJC students sat for the 2018 AP exam

BJC has trained over 630 teachers.

BJC offers a 5-day in-person, summer PD. NYC DOE CS4All staff offer a 2-week summer PD.

NATIONAL REACH
BJC has been offering training since 2012.

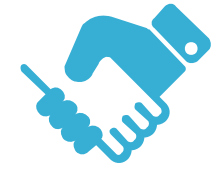In summer of 2018, BJC conducted 9 trainings in 7 different states.

REGIONS
» California
» Colorado
» Indiana
» New Jersey
» New York
» North Carolina
» Virginia

BJC Project Partners

Beauty and Joy of Computing is funded by the NSF as a **Math and Science Partnership** under grant no. 1441075. Partners meet online each month, share files via an online Google Drive, and collaborate more frequently as needed.

EDC	NYC DOE	NCSU	UC Berkeley	CSNYC
• Designing high school AP version of course • Conducting research on efficacy and attitudes	• NYC teacher recruitment • Training and supporting NYC teachers	• Non-NYC professional development • Developing Massive open online course (MOOC) PD	• Original BJC developers • Supporting curriculum development and teacher preparation • Maintaining programming language Snap!	• Building a community of practice among teachers in NYC • Hosting city-wide CS meet-ups

Emerging data and results from NYC Study

⊕ NYC BJC Student Enrollment

- **2,383 students—an increase of 1,000 students (since 2016-2017)**

- **Gains (since 2016-2017) in number of enrolled students who are:**

  - Female—up from 43% to 49% of our students

  - Black—up from 27% to 33% of our students

  - Hispanic—up from 28% to 29% of our students

⊕ NYC Research Findings

- Teachers and students both showed significant gains in content knowledge of AP CSP Big Ideas.
- Teachers' self-reported programming ability and computational fluency scores increased.

BJC is a collaborative, hands-on course

➡ Students (and teachers in PD) program in pairs

Hands-on Exploration with Pair Programming

Find one partner. You will need at least one computer.

- One partner should:
  1. Go to bjc.edc.org
  2. Click "BJC Curriculum"
  3. Navigate to Unit 1 Lab 1 Page 1: *Getting Started with Snap!*

- The other partner should:
  1. Go to snap.berkeley.edu/run
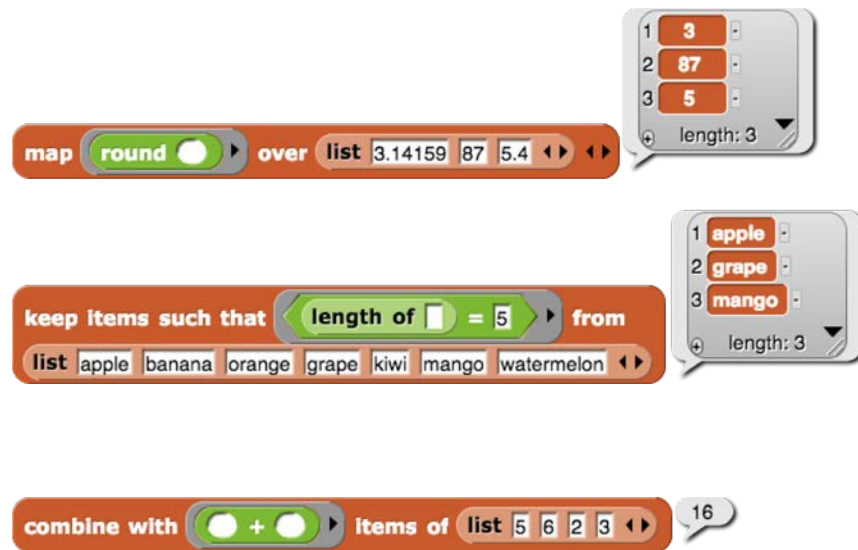 2. Follow the instructions on bjc.edc.org together

(If you have only one computer, open both sites in different windows or tabs.)

- Work through as much of **Unit 1 Lab 1** as possible. If you have time, begin Lab 2.
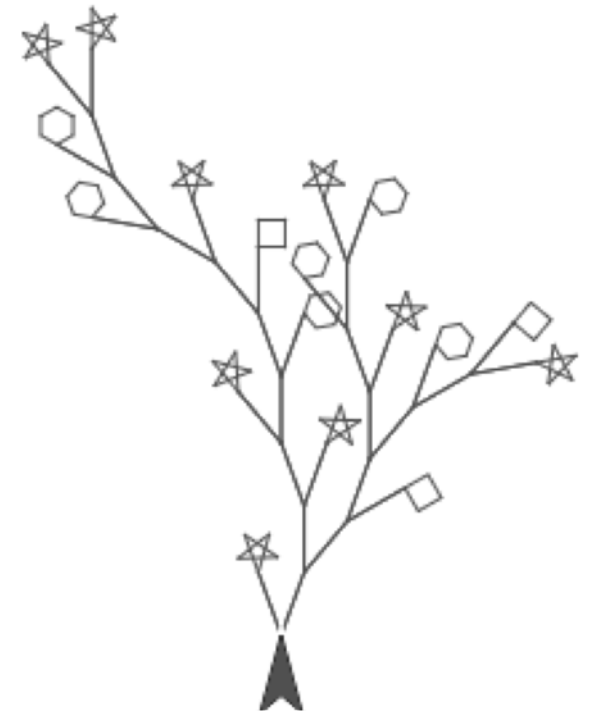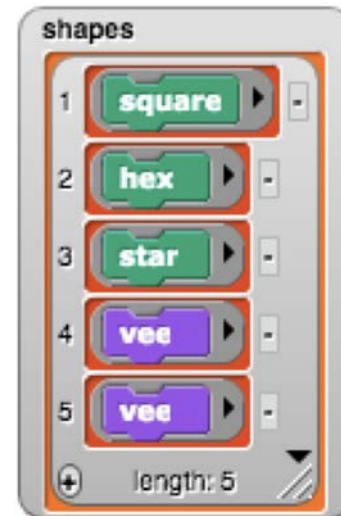
What makes BJC special?

Higher Order Functions: functions that take functions as input

Example: some simple uses

Recursion: when procedures call themselves

Example: vee

Further Examples of…

Higher Order Functions:

- Keep—Unit 2 Lab 3 Page 2

- Map—Unit 3 Lab 1 Page 4

- Combine—Unit 5 Lab 3 Page 1

Recursion:

- Recursive Tree—Unit 7 Lab 1 Page 1

- Triangle Fractal—Unit 7 Lab 2 Page 1

- Recursive Mondrian—Unit 7 Lab 2 Page 5
  (scroll to #6 for animation)

Questions?

THANK YOU

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Slides
go.edc.org/BJC-Summit-2018