Lowering the Barrier to Learning Programming
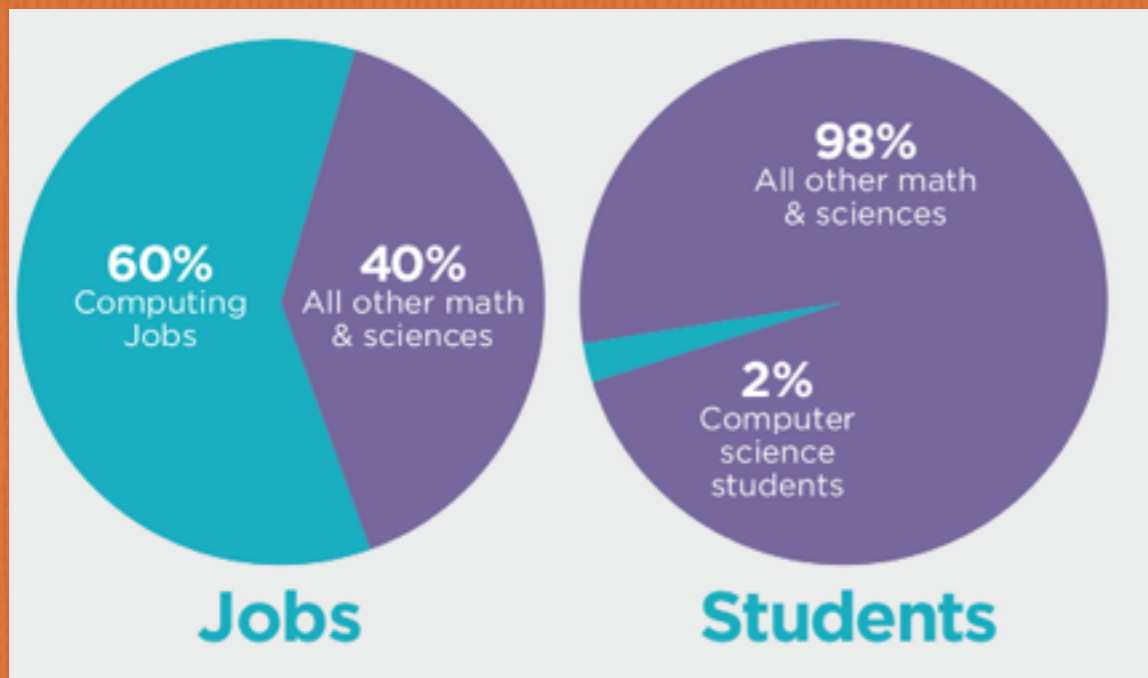
KHAN ACADEMY
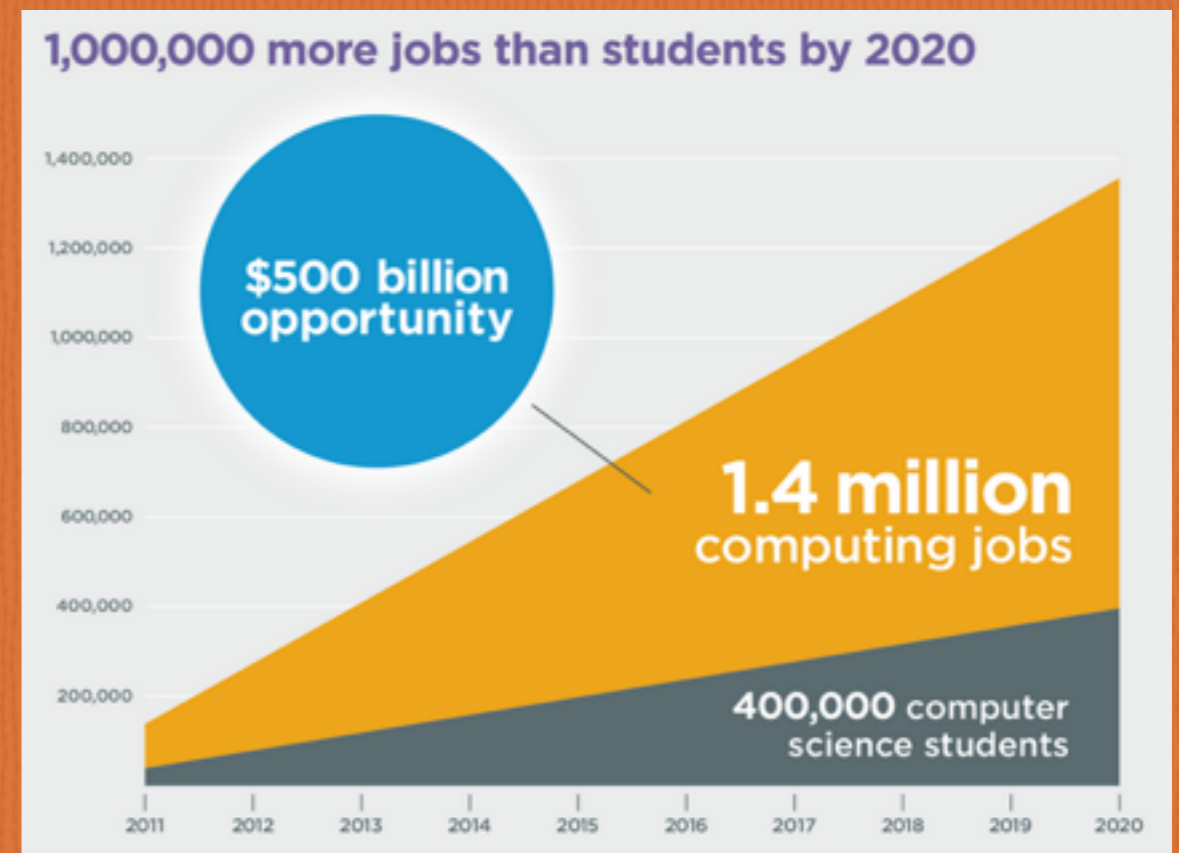
Pamela Fox

@pamelafox

Girl Develop It San Francisco

We need more programming literacy.

(In the U.S.)

(In the U.S.)

http://code.org/promote

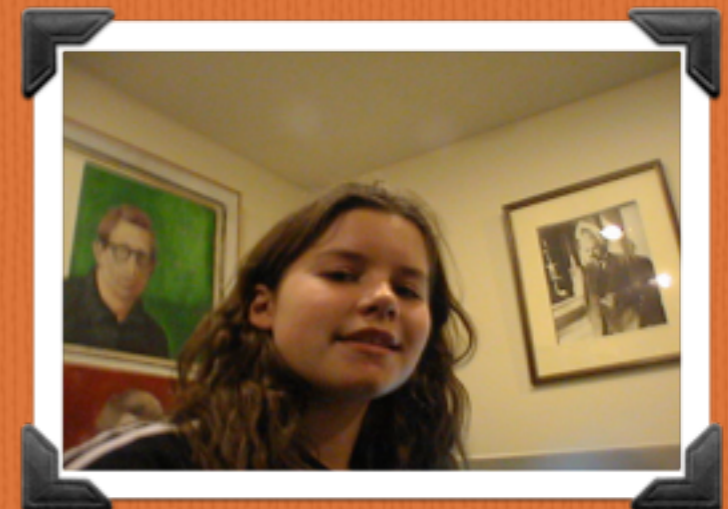# How can we increase those numbers more quickly?

How did I get into programming?

5 Computers

T1 Line

Supportive Parents

I was lucky.

We can't afford to
rely on luck anymore.

We need to lower the barriers.

You can help.

Barrier #1: Access to a Computer

DonorsChoose.org
Teachers ask. You choose.

U.S. public schools:

http://www.donorschoose.org/donors/search.html?
keywords=%22computer%20science%22

Spain/Europe:

http://www.ticbeat.com/general/como-donar-viejo-ordenador/

Reciclanet

Barrier #2: Local Dev Setup

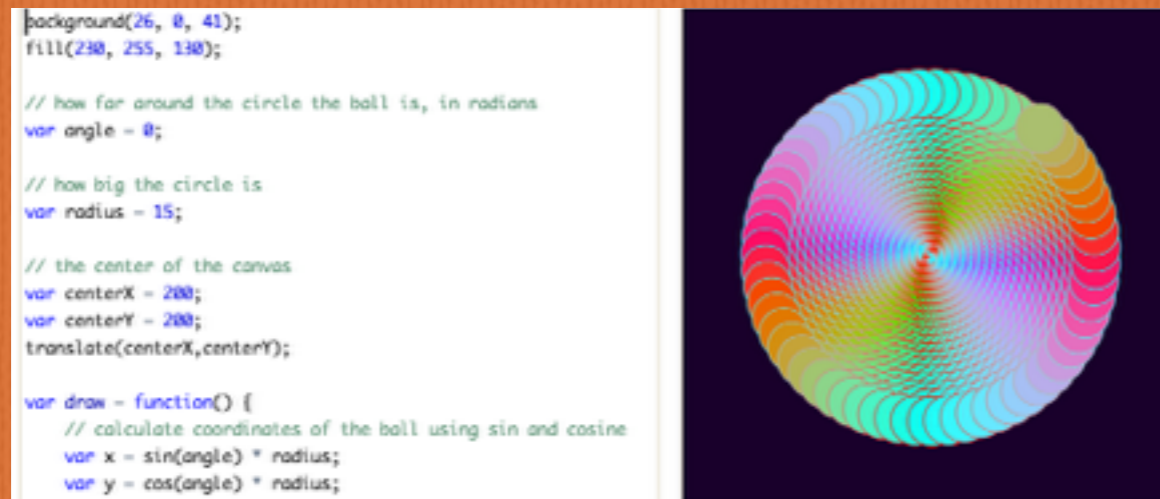Many students struggle with setting up a local environment

Many students don't have their own computers.

Many students are using ChromeBooks/iPads/Phablets.

…therefore, we need more online programming environments

Online Programming Environments

JavaScript

Khan Academy

HTML/CSS/JS

JSBin

JSFiddle   GA Dash

Thimble

CodePen

Block-based

Snap   Scratch   Blockly

Python

PyTutor   CodeSkulptor

Multi

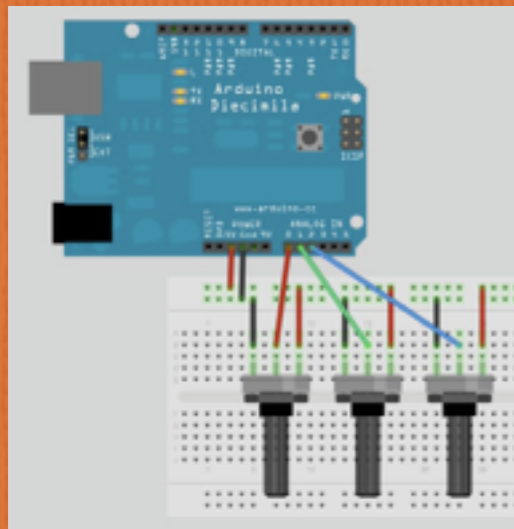REPL.it   Codecademy

Online Programming Environments

What are we missing?
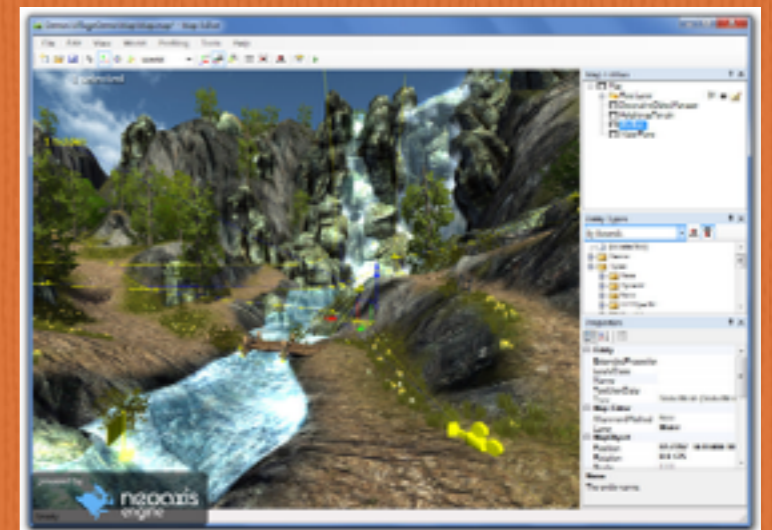
Hardware

Languages

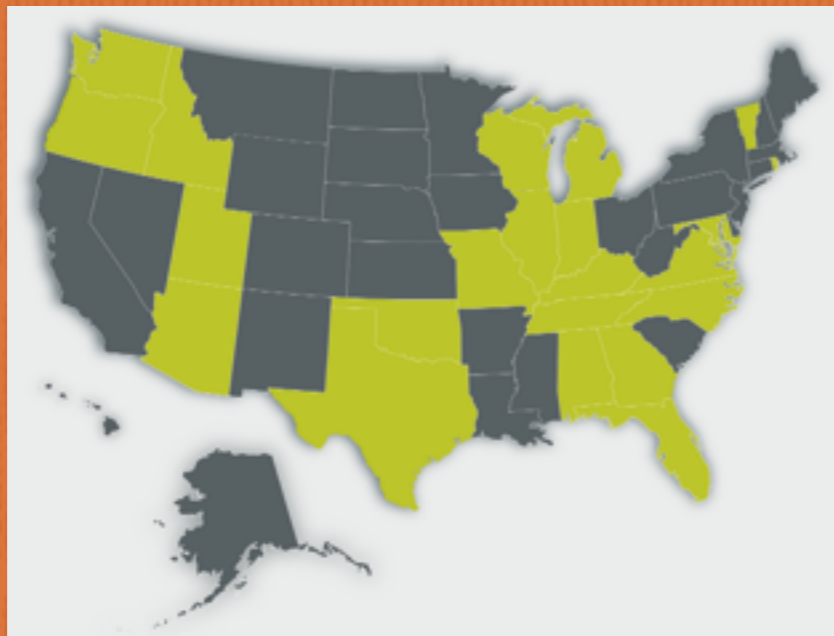Objective-C

Swift   C++

ChucK

Fortran

Use Cases

Curriculum/Community

Barrier #3: CS Classes

In the U.S.

In 28 out of 50 states, CS does *not* count towards math/science graduation requirements.

9 out of 10 high schools don't offer CS classes.

http://code.org/promote

CS classes need teachers

In Madrid, students in secondary school now have programming as a requirement:

"La Comunidad calcula que en los próximos cinco años unos 240.000 alumnos habrán estudiado dos años de programación y otros 60.000 habrían cursado para entonces el programa completo."

http://ccaa.elpais.com/ccaa/2014/09/03/madrid/1409772225_352560.html
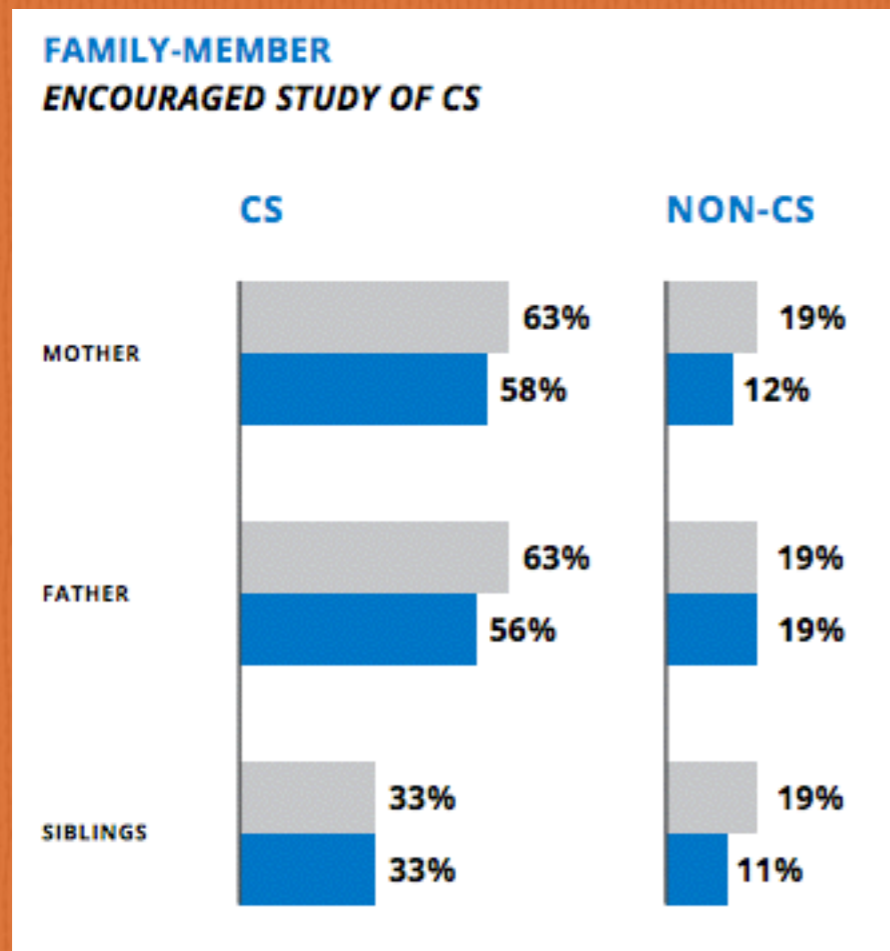
…Who will teach them?

Coding Clubs

CoderDojo

http://www.coderdojooc.com/

code club

girls who code

black girls CODE
imagine. build. create.

http://code.org/learn/local

https://www.flickr.com/photos/medialab-prado/

Barrier #4: Social encouragement

FAMILY-MEMBER
ENCOURAGED STUDY OF CS

	CS	NON-CS
MOTHER	63% / 58%	19% / 12%
FATHER	63% / 56%	19% / 19%
SIBLINGS	33% / 33%	19% / 11%

Most important
forms of encouragement:

1. Parental encouragement (regardless of occupation)
2. Familial encouragement
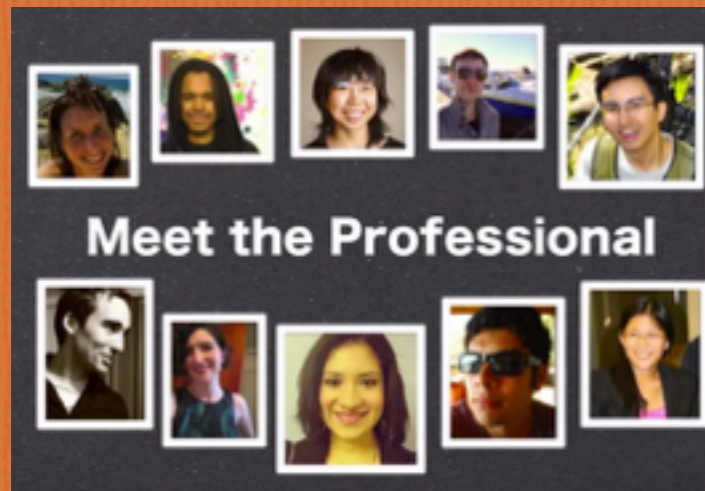3. Peer encouragement

Barrier #6: Career Misconceptions

"Research reports that students finishing high school have a difficult time seeing themselves as computer scientists since they <u>do not have a clear understanding of what computer science is and what a computer scientist does.</u>"

https://www.edsurge.com/n/2014-01-07-want-more-women-in-tech-fix-misperceptions-of-computer-science

Especially true for females.

http://static.googleusercontent.com/media/www.google.com/en/us/edu/pdf/women-who-choose-what-really.pdf

Barrier #6: Career Misconceptions
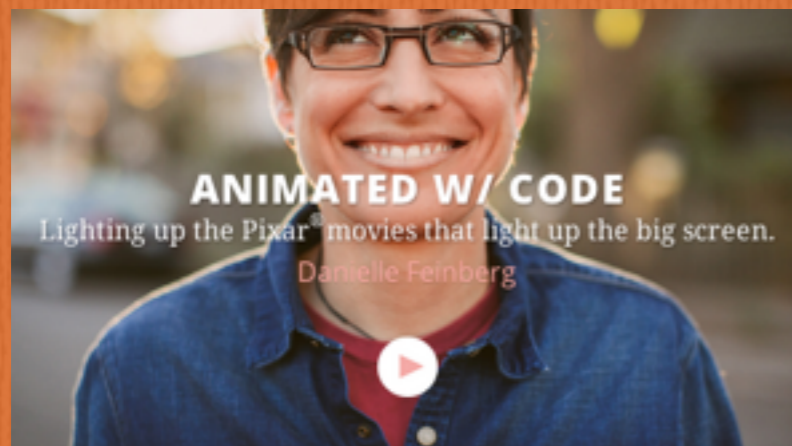
Meet the Computing Professional

www.khanacademy.org/meet-the-computing-professional

Computing is Everywhere

www.youtube.com/playlist?list=PLjqPzIdAG_dRdcgSf6uIG494o50M6Z_vm

Made With Code

www.madewithcode.com/mentors

That's not an exhaustive list.

2012 High School A.P. Enrollment

Exposure to CS leads to the some of the best-paying jobs in the world. **But 75% of our population is underrepresented.**

Of this group, only 15% are women, and only 8% are Hispanic Americans or African Americans

0.7% Computer Science

8% Students of color

15% Women

Source: College Board
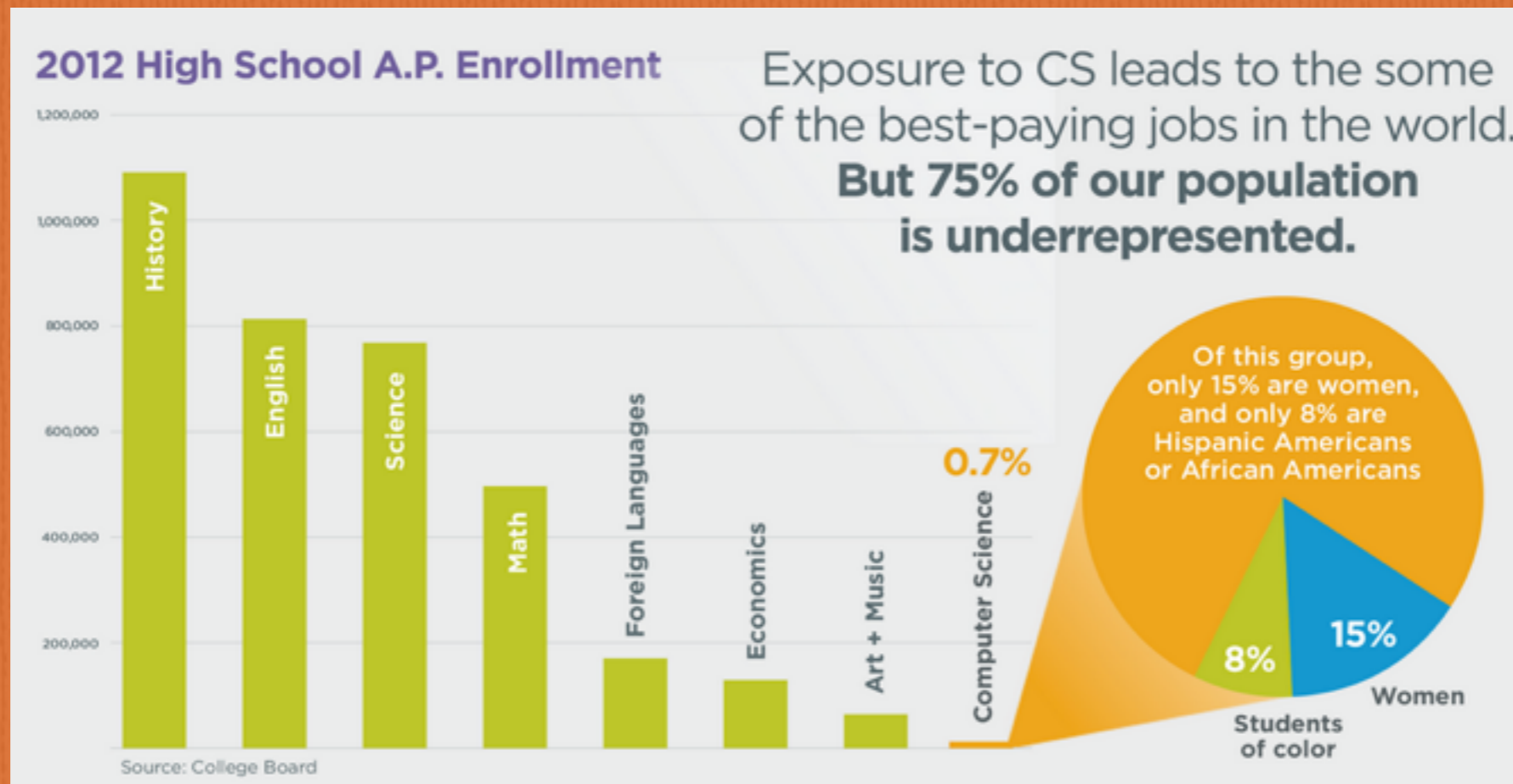
There are many more barriers, and many vary based on demographic.

Your goal:

lower the barrier for one kid to learn to code.

Pamela Fox
@pamelafox

Velocity 2014