ONLINE TOOLS FOR TEACHING CS
AP CS Principles - Overview

CT Practices
• Connecting Computing
• Creating Computational Artifacts
• Abstracting
• Analyzing Problems and Artifacts
• Communicating
• Collaborating

Big Ideas
• Creativity
• Abstraction
• Data and Information
• Algorithms
• Programming
• The Internet
• Global Impact
Beauty and Joy of Computing

Computer Science Principles

The College Board AP CS Principles curriculum framework is organized around seven "Big Ideas" (things to learn) and six "Computational Thinking Practices" (things to do):

**Big Ideas**
1. Creativity
2. Abstraction
3. Data and Information
4. Algorithms
5. Programming
6. The Internet
7. Global Impact

**Practices**
1. Connecting Computing
2. Creating Computational Artifacts
3. Abstracting
4. Analyzing Problems and Artifacts
5. Communicating
6. Collaborating
Beauty and Joy of Computing

- Based on the successful college course from Berkeley
- Uses the Snap! programming language.
- Snap is a revision of Scratch
- Runs in the browser using Javascript
  - Any device can run the programs
- [http://snap.berkeley.edu/run/](http://snap.berkeley.edu/run/)
- [http://bjc.berkeley.edu/](http://bjc.berkeley.edu/)
Pair-Programming

- Driver
  - *Uses the computer, does what the navigator says.*

- Navigator
  - *Has the instructions, tells the driver what to do.*
Pair-Programming – Switch Roles

- The person who was the navigator is now the driver.
Mobile CS Principles

This course is supported by the Mobile Computer Science Principles Project (Mobile CSP), an NSF-funded effort to provide a broad and rigorous introduction to computer science based on App Inventor, a mobile programming language for Android devices. The course is based on the College Board's emerging Advanced Placement (AP) Computer Science Principles curriculum framework for introductory computer science.

In this course you will learn computer science by building socially useful mobile apps. In addition to programming and computer science principles, the course is project-based and emphasizes writing, communication, collaboration, and creativity.

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Mobile CSP

- http://www.mobile-csp.org/
- http://ai2.appinventor.mit.edu/
- http://appinventor.mit.edu/explore/ai2/tutorials.html
Mobile CSP Workshop

- UNO – CS4HS
- June 20-23
- Work through the Mobile CSP Curriculum
- Participant stipends
  - $500/person stipend for four-day summer workshop (June 20-23, 2016),
  - $300/person portfolio completion bonus for Mobile CSP or CSTE 8030 courses
  - $50/person stipend for COP meetings: 4 meetings / year
  - $500/person participant travel stipends for rural teachers living >40 miles from Omaha
  - Android mobile device

Code.org CSP

- https://code.org/educate/csp
- Alice Steinglass presentation yesterday
PLTW - CSP

- Upfront and continuing costs
- Summer PD and continuing support
- Multi-year program

PLTW Computer Science empowers students in grades 9-12 to become creators, instead of merely consumers, of the technology all around them. The program engages students in real-world activities like creating an online art portal and using automation to process and analyze DNA-sequence data. These projects and problems engage students in computational thinking, challenge them to think big, and help illustrate how intricately computer science is woven into our society.
Python Programming

- [https://interactivepython.org/](https://interactivepython.org/)
- Think like a Computer Scientist
- CS Principals: Big Ideas in Programming
Python Practice

- Codingbat.com
- ProjectEuler.net
Microsoft Creative Coding

Data Mining – Tuva Labs

- https://tuvalabs.com/datasets/pixar_vs_dreamworks
Cyber Security
Capture the Flag (CTF)

- https://picoctf.com/
- http://easyctf.com/
- http://hsctf.com/
- http://cryptoctf.ctfd.io/
Middle School CTF
U.S. CyberPatriot

- [https://www.uscyberpatriot.org/](https://www.uscyberpatriot.org/)
Breaking Locks, It’s a Snap!

- [http://snap.berkeley.edu/snapsource/snap.html#present:Username=DerekBabb&ProjectName=ComboLock2](http://snap.berkeley.edu/snapsource/snap.html#present:Username=DerekBabb&ProjectName=ComboLock2)

- Shout Key – be
  - [http://shoutkey.com/be](http://shoutkey.com/be)
Self-Paced & Web-Based

- https://www.codecademy.com/learn
- https://www.freecodecamp.com/
CS Without a Computer

- http://csunplugged.org/
CS Access and Equity

ShoutKey: coconut

https://docs.google.com/forms/d/19EK9BdWE394B3c9smpHOJHiKifCjk7bhIsLYn8I2m8/viewform
Connect

- Local CSTA Chapters
  - Lincoln
  - Omaha

- National CSTA
Get Involved

- K12 CS Framework
  - https://k12cs.org/
- CSTA Standards
  - Next revision in June
  - Will be updated after K12 Framework
Get a degree or endorsement!

Teach PK-12 Computing

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