



Computer Science Teachers

1. What should be the goals of K-12 Computer Science education? At the end of computer science students should....

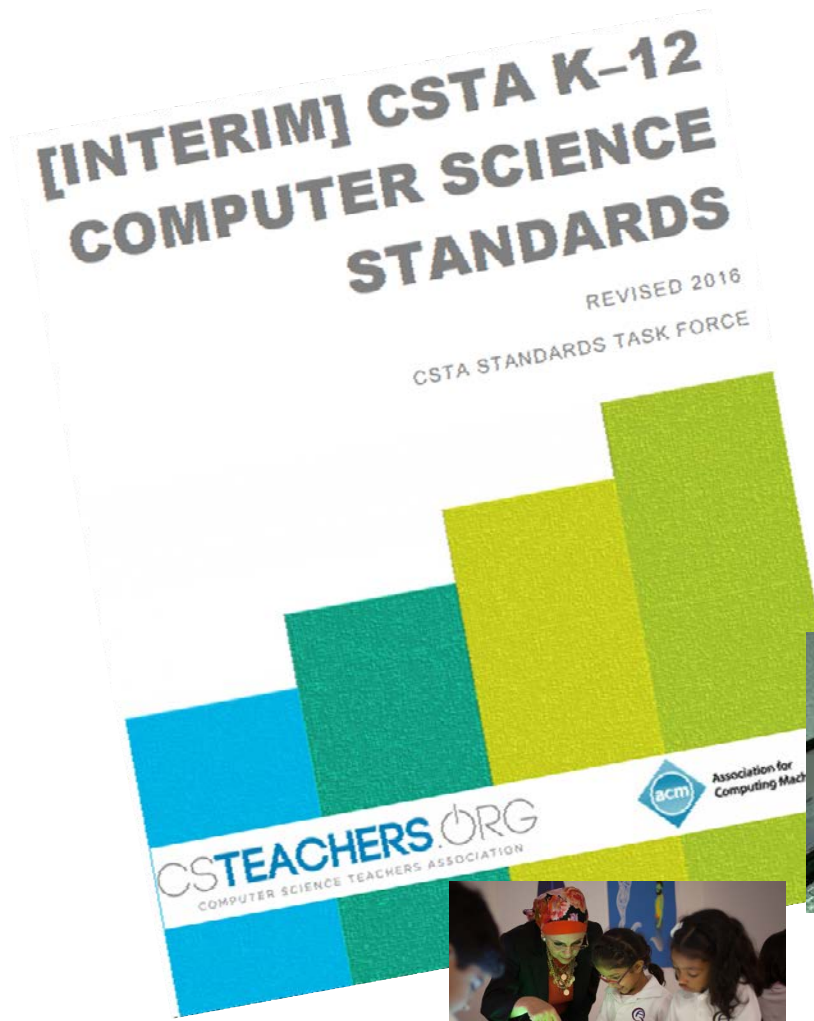
CS students, grade 12, should be able to understand and code in one universally acknowledged programming language (HTML, C - Various, Java, or Python).

Students should be able to take those skill sets and create a simple program.

2. What content should be covered in K2 computer science education?

	K-2	3-5	6-8	9-10	11-12
Cognitive Process			Algorithms Functions Debugging		
When the Course should be taught	Afterschool Enrichment	Enrichment	Course offered as an Electives MYCS	Course offered as an Elective: CS 1 CS 2	Course offered as an Elective: CS 3 CS 4 - AP
Supports and Resources	*Bee Bot *Osmo Coding *Scratch Jr *Code.org Level 1	*Scratch Jr *Scratch (4 th - 5 th) Code.org Level 2 and 3	*Code.org Level 3 or 4 / Accelerated *Foundations of Python *Combat Code *Python for Kids	Programing Language -Combat Code -	Programing Language AP CS course Robotics Course

Current Computer Science Reference Guide

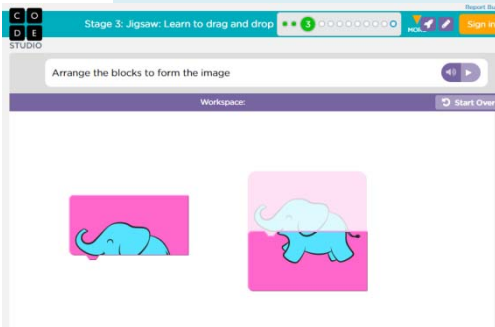


July 2016 - Update

Key Strands:

- Algorithms and Programs
- Computing Systems
- Data and Analysis
- Networks and the Internet





K -2



Computational Thinking

- Sequencing and Order
- Use manipulatives



Algorithmic Thinking

3-5

Computational Thinking

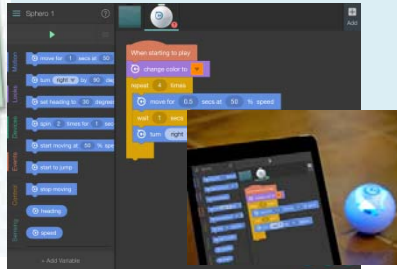
- Sequencing and Order
- Use manipulatives



Algorithmic Thinking –

Vocabulary Development





6-8



Computational Thinking

Computer Science Discoveries



Computer Science Discoveries is a full-year introductory computer science survey course (can be implemented as two standalone semesters) targeted at upper middle school and lower high school (grades 7-9). The course takes a wide lens on computer science by covering topics such as programming, physical computing, HTML/CSS, and data. Students are empowered to create authentic artifacts and engage with CS as a medium for creativity, communication, problem solving, and fun. This course will be piloted in Spring 2017, and will be rolling out Summer 2017.

Units of Study

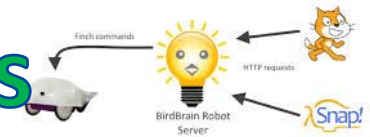
- Unit 1: Problem Solving: Computers and Logic
- Unit 2: The Internet: Web Development
- Unit 3: Programming: Interactive Games & Animations
- Unit 4: Problem Solving: The Design Process
- Unit 2: The Internet: Data and Society
- Unit 3: Programming: The Internet of Things

[Learn more about curriculum](#) [Apply for professional learning](#)

- Sequencing and Order
- Use manipulatives

Algorithmic Thinking

(Loops, Functions, Pattern Matching, Decomposing)



Vocab Development and Reinforcement

Intro to Programming Language

Course 3

Course 3 is a follow-up to Course 2.

Ages 8-18

Course 4

Students taking Course 4 should have already taken Courses 2 and 3.

Ages 9-18

Accelerated Course

Learn basic computer science in an accelerated version of courses 2-4.

Ages 10-18



SCRATCH





9-10



Computational Thinking

- Sequencing and Order
- Use manipulatives

Algorithmic Thinking

(Loops, Functions, Pattern Matching, Decomposing)

Vocab Development and Reinforcement

Intro to Programming Language

Organization	Curriculum	Professional Development
Beauty and Joy of Computing	Year-long CS Principles course, FREE	In-person in NYC, Berkeley, CA and North Carolina, FREE, stipends in NYC, stipend or travel elsewhere paid as available
Bootstrap	Teach algebra through video-game programming, with a 20-hr module to go alongside or inside a math class	3-day workshops for schools and districts. Fees range
CodeHS	4-year high school CS pathway. Intro CS JavaScript, Intro CS Python, AP CS Principles, AP CS in Java, Computing Ideas, Web Design and more, FREE. Pro plans for schools start at \$2500	Online PD for Teaching Intro CS, Teaching AP Java, and Teaching AP CS Principles, 30-40 hour course, \$1500/teacher
Edhesive	Year-long AP Computer Science course, FREE	Online PD, content and content/technical integration support available for \$1000/school
Exploring Computer Science	Year-long introductory high school course aimed at broadening participation in CS. 6 units, 6 weeks each	Week-long summer institute and quarterly one-day academic year workshops
Globaloria	6 game-design courses, \$75/student	3-day in-person training and online self-paced training
Year-long Computer Science Principles course.		Online, regional in-person offered in CT, MA, NH and CA (other states available), FREE, stipend available

Course 3
Course 3 is a follow-up to Course 2.
Ages 8-18

Course 4
Students taking Course 4 should have already taken Courses 2 and 3.
Ages 9-18

Accelerated Course
Learn basic computer science in an accelerated version of courses 2-4.
Ages 10-18



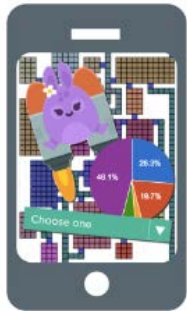
11-12

Ready for the next step? JavaScript Tools for High School

App Lab

Ages 13+

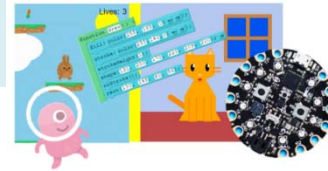
App Lab is a programming environment where you can make simple apps. Design an app, code with blocks or JavaScript to make it work, then share your app in seconds.



Learn how



Computer Science Discoveries



Computer Science Discoveries is a full-year introductory computer science survey course (can be implemented as two standalone semesters) targeted at upper middle school and lower high school (grades 7-9). The course takes a wide lens on computer science by covering topics such as programming, physical computing, HTML/CSS, and data. Students are empowered to create authentic artifacts and engage with CS as a medium for creativity, communication, problem solving, and fun. This course will be piloted in Spring 2017, and will be rolling out Summer 2017.

Units of Study

- Unit 1: Problem Solving: Computers and Logic
- Unit 2: The Internet: Web Development
- Unit 3: Programming: Interactive Games & Animations
- Unit 4: Problem Solving: The Design Process
- Unit 2: The Internet: Data and Society
- Unit 3: Programming: The Internet of Things

[Learn more about curriculum](#) [Apply for professional learning](#)

Computational Thinking

Sequencing and Order

Use manipulatives

Algorithmic Thinking

(Loops, Functions, Pattern Matching, Decomposing)

Vocab Development and Reinforcement

Programming Language

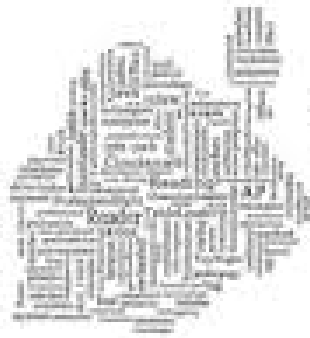
AP - Courses



Course	Description	Details
Beauty and Joy of Computing	Year-long CS Principles course, FREE	In-person in New York, Berkeley, CA and North Carolina. Stipends in NY and elsewhere paid as available
Bootstrap	Teach algebra through video-game programming, with a 20-hr module to go alongside or inside a math class	3-day workshops for schools in various districts. Fees range
CodeHS	4-year high school CS pathway. Intro CS JavaScript, Intro CS Python, AP CS Principles, AP CS in Java, Computing Ideas, Web Design and more, FREE. Pro plans for schools start at \$2500	Online PD for Teaching Intro CS, Teaching Java and Teaching AP CS Principles
Edhesive	Year-long AP Computer Science course, FREE	Online, self-paced. Support available, \$2,200 per school
Exploring Computer Science	Year-long introductory high school course aimed at broadening participation in CS. 6 units, 6 weeks each	Quarterly one-day academic year workshops
Globaloria	6 game-design courses, \$75/student	3-day, in-person or ongoing online PD, in student price
Mobile CSP	Year-long Computer Science Principles course, materials available online, FREE	Online, regional in-person offered in CT, MA, NH and CA (others may be available), FREE, stipends

Knowledge and Capabilities would define a College-Ready CS Student

College
READY



AP
Computer
Science



Knowledge and Capabilities would define a Career-Ready CS Student



INTERNSHIPS

3.Scope and Sequence **Middle School**

Month	Topic	Links to Items
AUG 15 instructional days	-Light Bot (First 2 Weeks of School Year) HMC (What makes a Computer)	https://lightbot.com/hocflash.html https://sites.google.com/a/g.hmc.edu/mycs/home/unit-2
SEPT 16 instructional days Labor Day 5th PD 20th	Scratch Basics: - Basic Blocks - Stage Specifications (X and Y axis) - Debugging activity -Animate Your Name Activity -Video Game 1 (Basket Catch) - (Variables, and If, Else) - Broadcasting -Video Game 2 (Basic Maze - Color Sensing)	(TV shows: Limitless Sequence showing Mind Maps) - Video Game 1 (Basket Game) - Variables and Broadcasting. - Color Sensing Lunch Time Arcade
OCT 21 Instructional Days	CODE.ORG Course 3 For early finishers (Challenge course 4) (Review course 2)	Candy Coding Decomposition, Pattern Matching, Abstraction, and
NOV Vet Day 11th PD day NOV 1st Thanksgiving 16 Instructional Days	Video Productions -Based off the an article or literature (Greek myths or Shakespeare) or a Cause and Effect (Microbead) have students complete and create ("Mini Video") Looking at a Song with Strong idiomatic language. Create a video the best reflects the ideas	Story Teller Info-graphic that shows how the student view the Computer Science profession Think Idiomatically

DEC 12 instructional days	Google CS first Model (Hackathon)	https://www.cs-first.com/materials
JAN 21 Instructional Days MLK 16th	App Builder http://appinventor.mit.edu/expl ore/sites/all/files/ConceptCards/ai2/AppInventorMakerCards.pdf Or APP LAB https://code.org/educate/applab	http://appinventor.mit.edu/expl ore/teach.html?
FEB 17 Instructional Days PD -2 Lincoln - 13 Washing -20		
MARCH 20 Instructional Days PD -9th CUE - 16th	Basics of robots Finch Bots - Great Maze Challenge	https://sites.google.com/a/g.hmc.edu/mycs/home/unit-9
APRIL 15 Instructional Days	Finch Bots - Great Maze Challenge	
MAY/JUNE 24 Instructional Days	Foundational Python for Kids <u>CODE Academy</u> - Python for Kids	

4. California CSS connection to CSS and other content areas

5. Other Computer Science Standards will be useful tool for California Educators?