Rebooting Computer Science Education with the New Principles Course

Francisco Nieto
EdTech Program Manager, Alameda County Office of Education
fnieto@acoe.org
@mexifornio
Explore the new AP CS Principles Course and how it can make computer science more accessible and engaging to a wider population.
What we’ll cover

goo.gl/KuZ3yR

1. About CSP Course
2. Delve into Framework
3. How to build your course
4. Performance tasks
5. Resources
6. Activity: Big Idea playhouse
What are the Computer Science Principles?
Low Enrollment and for Current AP CS

African-American and Latino students make up 59% of California public school students but were just 11% of 2014 AP Computer Science test takers.

Source: Path Not Found (LPFI, 2015)
Of the more than half a million high school students in the largest 20 districts, just 1% are in any computer science course.

Source: Path Not Found (LPFI, 2015)
Unequal Access

Over 75% of schools with the highest percentage of low income students offer no computer science courses.

Source: Path Not Found (LPFI, 2015)
Initial Partnership

NSF + CollegeBoard
"AP Computer Science Principles is designed to broaden the number and diversity of students who participate in computing, engaging students with diverse backgrounds and interests."

Jim Kurose, head of Computer and Information Science and Engineering at NSF
Rigorous
Engaging
Relevant
CSP

{ 
  Inclusion
  Creativity
  Human connections
  Problem solving
  Impact on society
}
CSP

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- Problem solving
- Impact on society
CSP

Inclusion
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Human connections
Problem solving
Impact on society
We are offering

CSP4T

Computer Science Principles for Teachers

http://csp4t.acoe.org
How is the Framework Structured?
BIG IDEAS

- CREATIVITY
- ABSTRACTION
- DATA AND INFORMATION
- ALGORITHMS
- PROGRAMMING
- INTERNET
- GLOBAL IMPACT
BIG IDEAS

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Big Ideas

Creativity
Abstraction
Data and Information
Algorithms
Programming
Internet
Global Impact
How are teachers building their courses?
CSP Resources and Courses
Performance Tasks
ACTIVITY: Design a course!
Why MakingMath?

\[
\frac{24}{40} \cdot \frac{8}{24} = \frac{1}{5}
\]

Constructivism <=> Constructionism

creating the conditions under which intellectual models will take root
Measure:

1. Measure your bamboo.
2. Predict what note it will make.
3. Measure the note with an app.

#makingMath
Build: #makingMath

1. Make a group of 4.

2. Coordinate who will play what note: A, B, D, and G

3. Calculate the length your pipe needs to be to play that note.

4. Cut and test your pipe.
Verify:

1. Did your pan pipe play the right note?

2. If not, check your calculations and measurements.

3. If you didn't find your error ask one of your groupmates to do the same.
Test:
1. Play Mary Had a Little Lamb with your band
   BAGABBB
   AAABDD
   BAGABBB
   BAABAG

2. Once your group has finished answer the reflection questions.
Look back:
- What scaffolds did I provide for you ahead of time?
- What scaffolds did I provide for you in the moment?
- What scaffolds did I not provide? Make a guess as to why I didn’t provide them.
- What math practices did you engage in?
- What math content standards did you engage in?
Plan: #makingMath

- Where would this lesson fit into your curriculum?

- Check out this list of ideas and resources: goo.gl/u3yDXQ

- Find one and tweet it #makingMath
Share: #makingMath

1. Look through the ideas your colleagues posted and like or retweet as you see fit.

2. The idea with the most likes and/or retweets will be asked to present their idea.
Thank you for your participation!

Jim Town
jtown@acoe.org
@town_math
#makingMath
#makingMath: How to Facilitate and Integrate Making into your Curriculum

Jim Town  
Math Specialist  
ACOE Core Learning  
CA STEM Symposium

**Measure**

- Use the tools and reference materials at the center of your table to help you predict the note your pan pipe will play.
- Measure the note with a tuning app. I like gStrings for Android, I hear PanoTuner works for iOS (both are free).

**Notes:**

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**Build**

- Make a group of 4 (come up with your band’s name, if time permits).
- Coordinate who will play each note (need A, B, D, and G).
- Calculate the length your pan pipe needs to be to play your note.
- Cut and test your note.

**Notes:**

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**Verify**

- Did your pan pipe play the right note?
- If not, check your calculations and measurements.
- If you didn't find your error ask one of your groupmates to do the same.

**Notes:**

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Presentation: goo.gl/jqcPNQ

Test

- Play Mary had a Little Lamb with your band.
- How do the notes sound together?

Notes:

Look Back

- What scaffolds did I plan for you ahead of time?
- What scaffolds did I provide for you in the moment?
- What scaffolds did I not provide? Make a guess as to why I didn’t provide them.
- What math practices did you engage in?
- What math content standards did you engage in?

Notes:

Plan

- Where would this lesson fit into your curriculum?
- Check out this list of ideas and resources: goo.gl/u3yDXQ
- Find one you like and tweet it #makingMath

Notes:

Share

- Go to https://twitter.com/hashtag/makingmath and like and/or retweet your favorite ideas.

Notes: