Computer Science Principles
For The Win
Brook Osborne and Pat Yongpradit
1. CS P Meets the Needs
2. The Case for Credit
3. Go on a Treasure Hunt
4. Future: Pilots and Prep
5. Questions

Agenda
CS Principles
Meets the Needs
1 in 10

Schools offer Computer Science
1 in 20 High Schools are certified to offer AP CS (2011)
#1

MD ranked first in AP CS exams per capita student population (2011)
CS Principles is designed to...

Increase Exposure to CS
5.1

Percent of AP CS exam-takers were Black/African American (2012)
9.4

Percent of AP CS exam-takers were Hispanic/Latino (2012)
Percent of AP CS exam-takers were female, **lowest** of any AP course.
MD has the 4th highest participation rate among women and minorities.
CS Principles is designed to...

Improve Diversity in CS
2020

The year that current 9th graders will graduate from college
1,000,000
More computing jobs than CS students in 2020
#1

Where the DC area ranks in IT hiring
CS Principles will...

Boost the CS job pipeline.
CS Principles Philosophy

More than just content...
It’s about how kids learn
How the teacher teaches
How computer scientists work

- Attitudes
- Behaviors
- Language
- Skills
What is CS Principles?
What is CS Principles?

- Creativity
- Abstraction
- Data

- Algorithms
- Internet
- Impact
- Programming
What’s in it for ____?

Students
Teachers
Schools
Maryland
CS Principles will...

- Increase Exposure to CS
- Improve Diversity in CS
- Boost the CS Jobs Pipeline
CS Principles is designed to...

Increase Exposure to CS
Boost the CS Jobs Pipeline
Improve Diversity in CS
Make the case for credit, but it can
The Case for Credit
10 States offer core credit for Computer Science
Math Credit:

Common Core:
Build new functions from existing functions.
(F-BF.3)

CS Principles:
Select appropriate combinations of algorithms to make new algorithms.
(LO 17b)
Common Core (Modeling):

“When making mathematical models, technology is valuable for varying assumptions, exploring consequences, and comparing predictions with data”

CS Principles:

Use models and simulations to raise and answer questions.
(LO 10)
Science Credit:

**CS Principles:**

Use models and simulations to raise and answer questions.
(LO 10)

**Next Generation Science Standards:**

Use a computer simulation to model the impact of proposed solutions to a complex real-world problem ...
(HS-ETS1-4)
Science Credit:

Using Mathematics and Computational Thinking

“Mathematical and computational thinking in 9-12 builds on K-8 experiences and progresses to using algebraic thinking... and computational tools for statistical analysis to analyze, represent, and model data.”
The Key to Credit is Computational Thinking
What is computational thinking?

Connecting Computing
Computational Artifacts
Abstracting

Analyzing problems
Communicating
Collaborating
CS P Sample Lesson
Treasure Hunt Activity
CS P and the 5 E’s

Engage
Explore
Q: How did you create the map?

Discuss:
The different islands represent finite states. The map is called a state diagram.

Q: How does this relate to how a digital watch works?
CS P and the 5 E’s

Engage

Explore

Explain

Elaborate

Directions:

1. Work with a partner to create a state diagram for a car radio, video game menu, or another electronic interface.
2. Include:
   • States
   • Transitions
   • Etc...
CS P and the 5 E’s

Engage
Explore
Explain
Elaborate
Evaluate

Rubric (10 pts)

Labeled states 3 pts.
Used arrows for transitions 3 pts.
Described two example paths 4 pts.

Total: _____
CS P and the 5 E’s

Engage
Explore
Explain
Elaborate
Evaluate

Exit Card (5 pts)

How can you program a device with only one button to do four different actions?
Portfolio tasks

Three performance-based tasks:

– Data
– Internet
– Programming
Pilot Program

Work directly with the College Board to implement, review, provide feedback on the curriculum framework, assessment, and the assessment platform.
<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010-11</td>
<td>Pilot I (5 universities)</td>
</tr>
<tr>
<td>2011-12</td>
<td>Pilot II (9 universities, 10 HS)</td>
</tr>
<tr>
<td>2012-13</td>
<td>Pilot III (2 universities, 4 HS)</td>
</tr>
<tr>
<td>2013-16</td>
<td>Years 1-3 of Pilot Phase II</td>
</tr>
<tr>
<td>2016-17</td>
<td>First exams offered</td>
</tr>
<tr>
<td>2017-18</td>
<td>Brook goes on vacation</td>
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</tbody>
</table>
How does MD prepare?

Renewal of CE21 Project
Curriculum Development
Statewide Implementation Plan
CS P meets the needs
CS P is a key to credit
CS P’s future is bright
Questions/Comments

Download pdf at CSprinciples.org

or patyongpradit.com