Computer Science Principles
For The Win

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DUKE COMPUTER SCIENCE

MONTGOMERY COUNTY PUBLIC SCHOOLS

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

Person
Ghost
Physics
Microsoft
for being
tremendously
nice

1 in 10

Schools offer Computer Science

1 in 20

High Schools are certified to offer AP CS (2011)

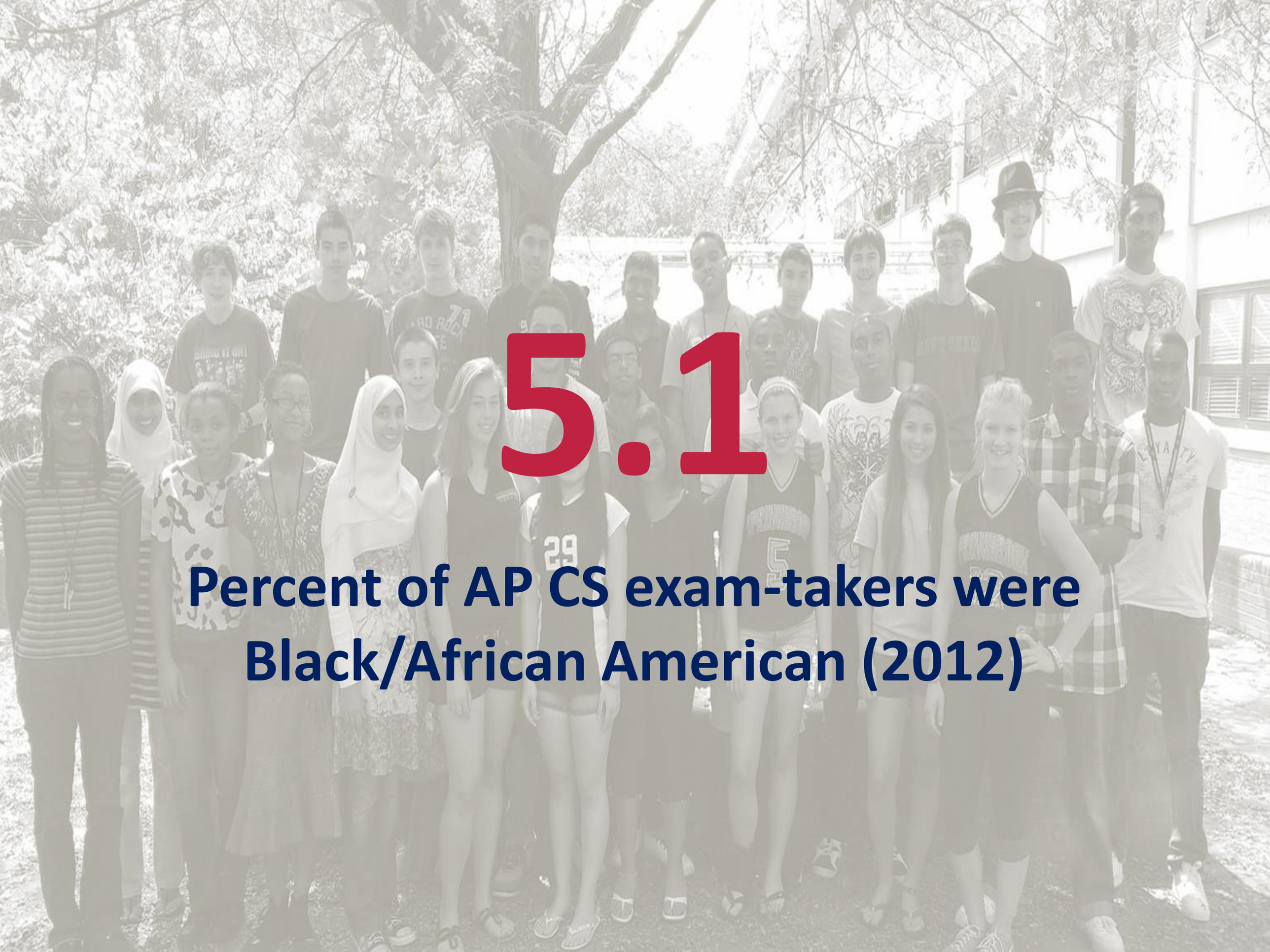
#1

MD ranked first in AP CS exams per capita student population (2011)

CS Principles is designed to…

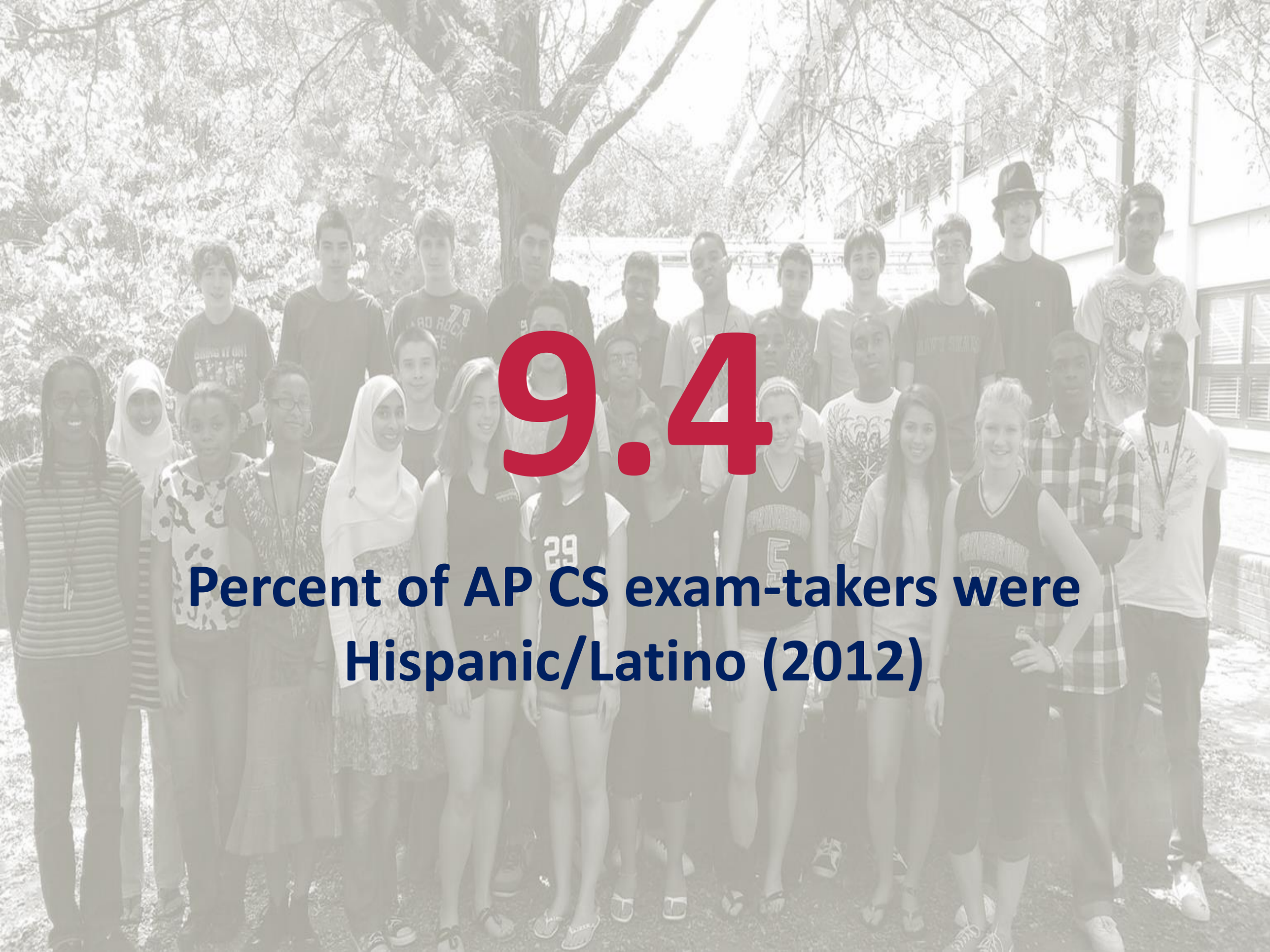
Increase Exposure to CS

BRING IT ON!
POLO
1967
NAVY SEALS
29
SPRINGBROOK
5
SPRINGBROOK
12



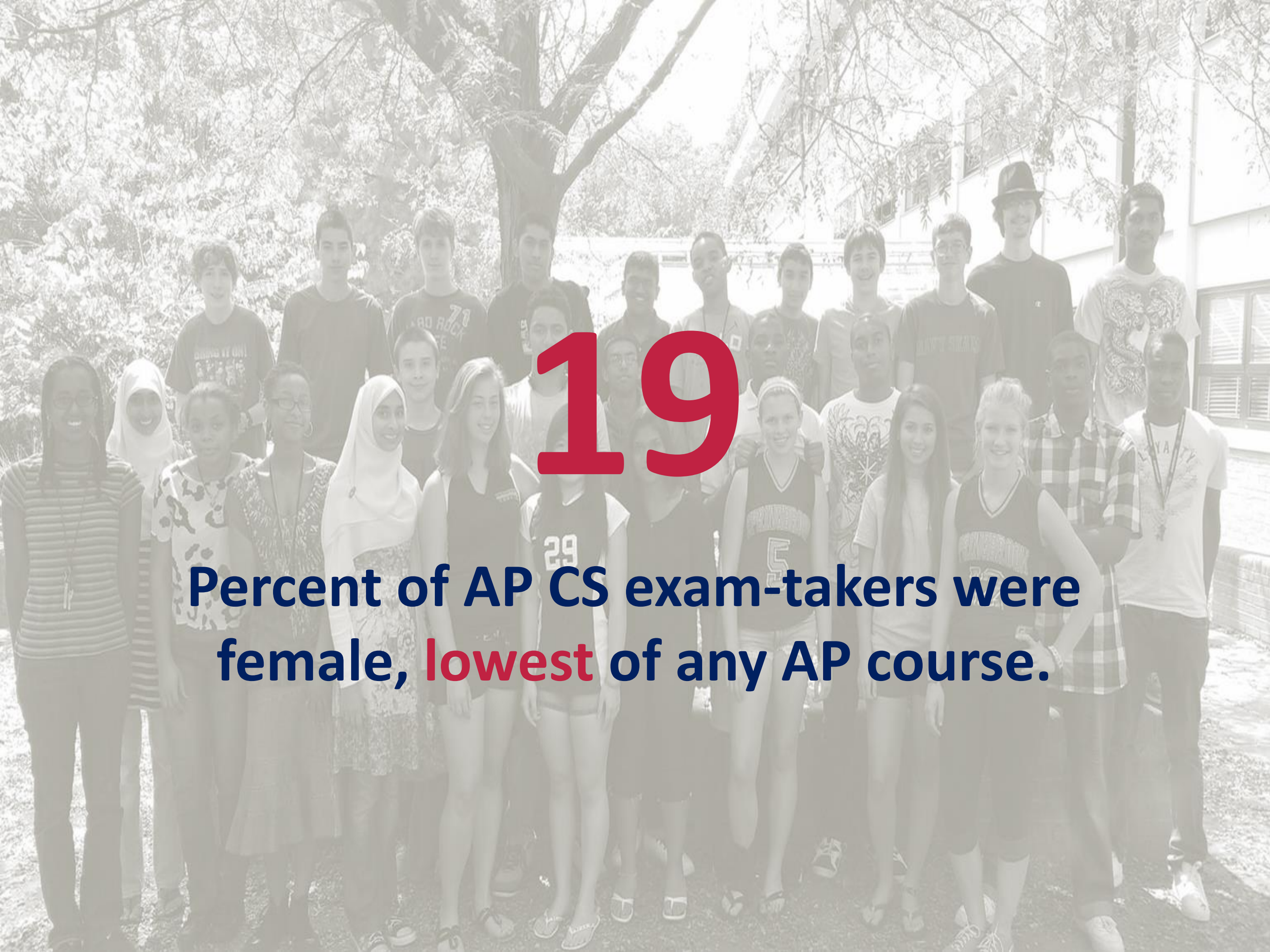
5.1

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



9.4

Percent of AP CS exam-takers were Hispanic/Latino (2012)



19

Percent of AP CS exam-takers were female, lowest of any AP course.

4th

MD has the 4th highest participation rate among women and minorities

CS Principles is designed to…

Improve Diversity in CS

Lamp & Fan in Series
Project #5
Lamp & Fan in Parallel
Project #6
ELECTRONICS
Projects

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**

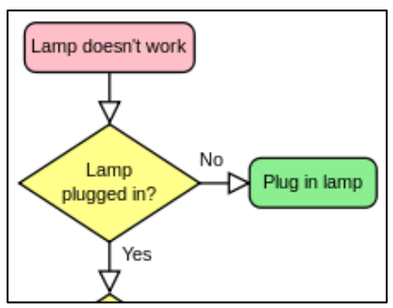
What is CS Principles?

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~~ wasn't 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

THE NORTH FACE
9797

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)

Math Credit:

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

CS P and the 5 E's

Engage

Explore

Explain

Q: How did you create the map?

<u>Discuss:</u>
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

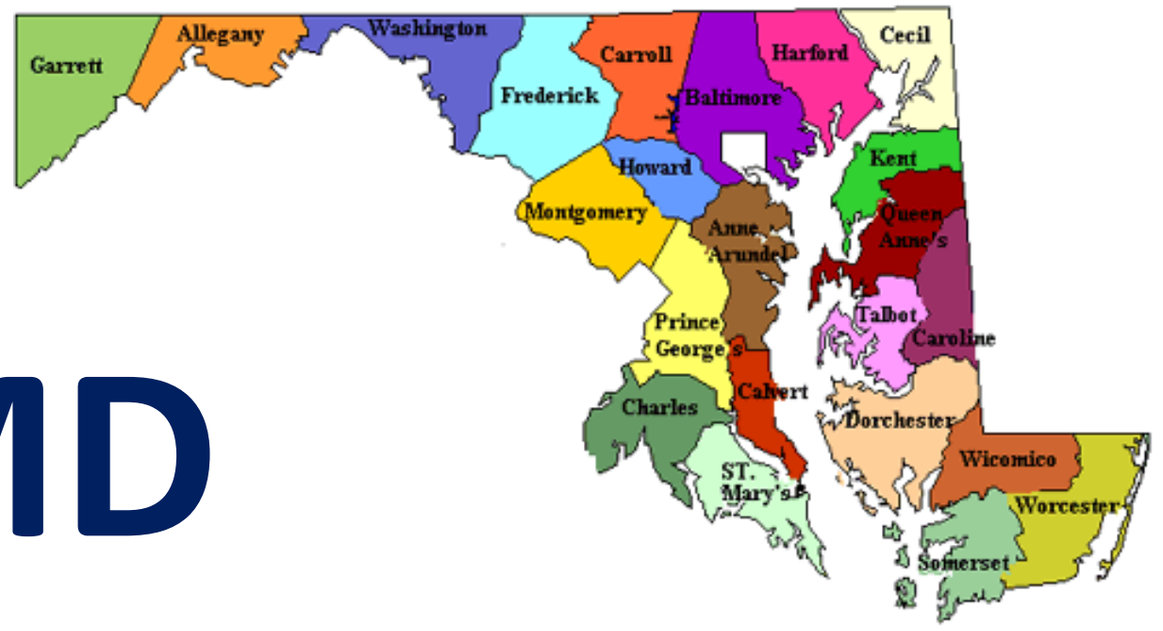
Pilot Program

Work directly with the College Board to implement, review, provide feedback on the curriculum framework, assessment, and the assessment platform.

Pilot Timeline

2010-11	Pilot I (5 universities)
2011-12	Pilot II (9 universities, 10 HS)
2012-13	Pilot III (2 universities, 4 HS)

2013-16	Years 1-3 of Pilot Phase II
2016-17	First exams offered
2017-18	Brook goes on vacation



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

Summary

Questions/Comments

Download pdf at CSprinciples.org

or patyongpradit.com