Introducing
AP® Computer Science Principles

Launching Fall 2016

AP

CollegeBoard

Agenda

► The value of AP Computer Science Principles (AP® CSP)

► Course and exam details

► Bringing AP CSP to your school

► Q&A

The Value of AP® CSP

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Overview: A Path Forward

2008

The College Board held a higher education faculty colloquium

2009 – 2010

20 professors conceptualized the major components of a curriculum framework for a new introductory CS course – Computer Science Principles (NSF grant funded)

2011

100 institutions reviewed the Curriculum Framework and attested to offer credit and/or placement for the course

2012 – 2014

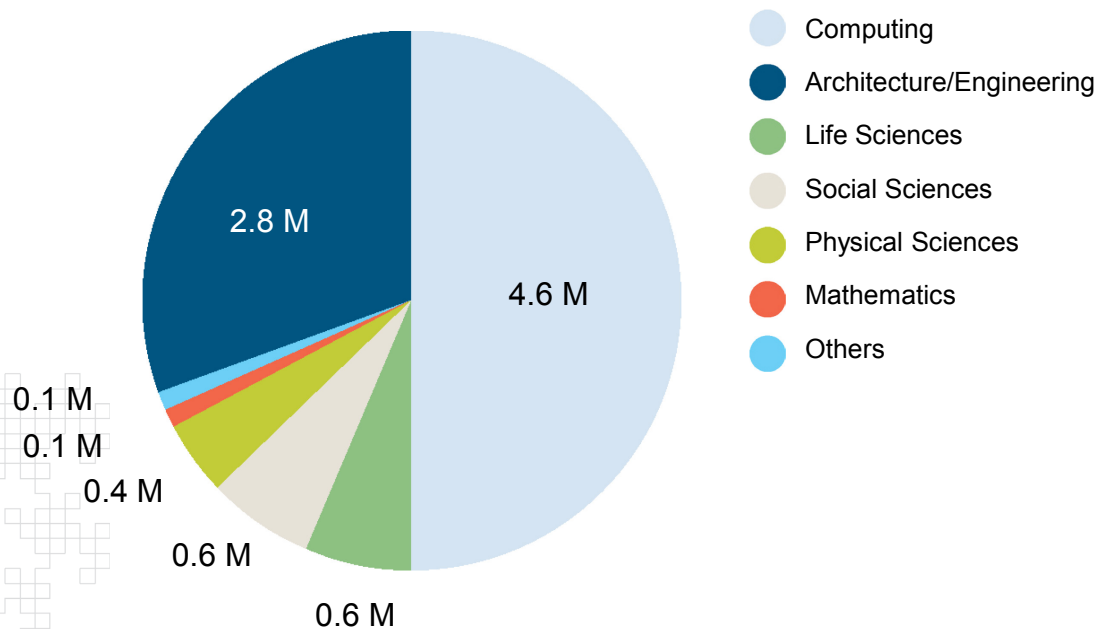Further vetting of the AP CS Principles Curriculum Framework and development of the AP Exam

2015 – 2016

Finalization of the AP Computer Science Principles Course and Exam for launch in fall 2016

Why AP® Computer Science Principles?

Of the more than 9 million STEM jobs available in the next decade, half will require computing experience.
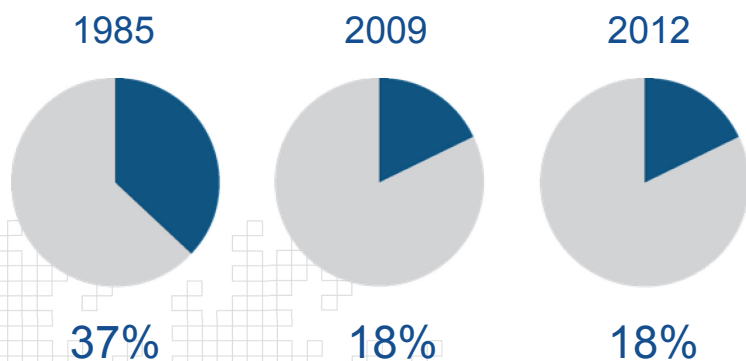
STEM Careers in 2020 (Projected)

- Computing — 4.6 M
- Architecture/Engineering — 2.8 M
- Life Sciences — 0.6 M
- Social Sciences — 0.6 M
- Physical Sciences — 0.4 M
- Mathematics — 0.1 M
- Others — 0.1 M

Why AP® Computer Science Principles?

The Diversity Challenge

Percentage of Computer Science Majors Who Were Women

1985	2009	2012
37%	18%	18%

Source: Department of Education

Percentage of Today's Software Workforces

- Male — 80%
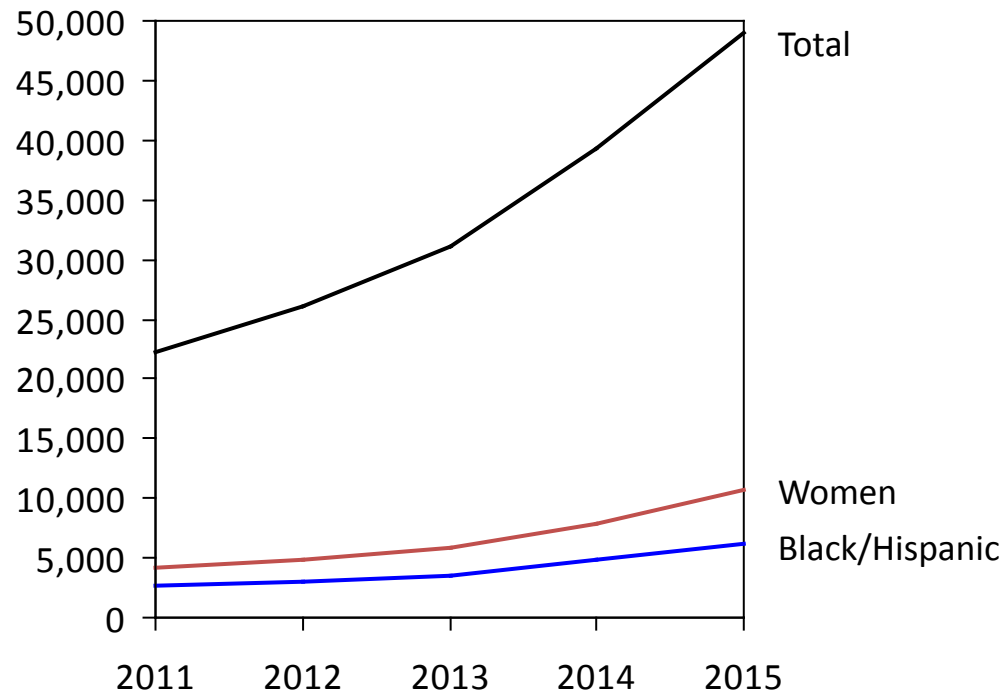- Female — 20%
- Asian — 29%
- Hispanic — 5%
- Black — 4%
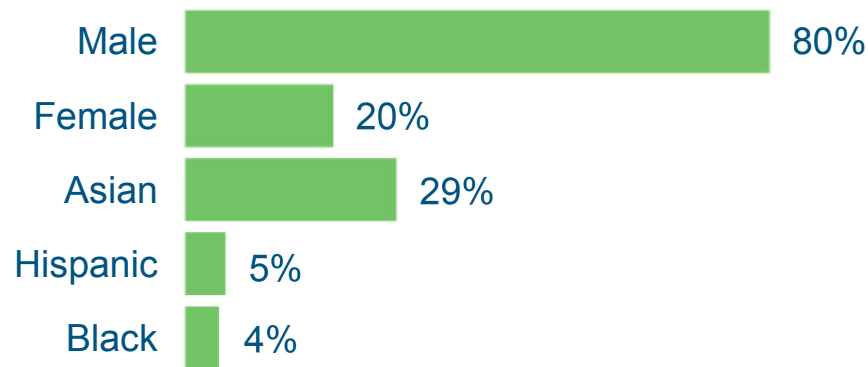
Source: Bureau of Labor Statistics

AP CSP is designed to encourage broader participation in computer science, especially among women and minorities.

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AP Computer Science A

AP CSA examinees

The chart shows AP CSA examinees from 2011 to 2015. The "Total" line rises from about 22,000 in 2011 to about 49,000 in 2015. The "Women" line rises from about 4,000 to about 10,500. The "Black/Hispanic" line rises from about 3,000 to about 6,000.

▶ AP CSA is the fastest growing exam in the last five years but more work is needed to close persistent gaps

Source: Advanced Placement

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Development of AP® CSP

Goals

► Make computer science more engaging and accessible

► Reach students underrepresented in computer science

► Better prepare students for the job market of today and tomorrow

A Collaborative Process

► Partnership with the National Science Foundation since 2008

► Educators from over 50 leading high schools and higher education institutions piloted the course

► 100 colleges and universities have indicated that they will create policies to grant credit and/or placement for the exam

Schools will begin to offer AP CSP in Fall 2016, with the first exam administration scheduled for May 2017.

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State Graduation Requirements

➢ 26 states (including District Columbia) allow computer science to count toward math and/or science

➢ 7 states (AL, CT, MS, NV, SC, TN, UT) require computer science to graduate

code.org/promote

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State Graduation Requirements
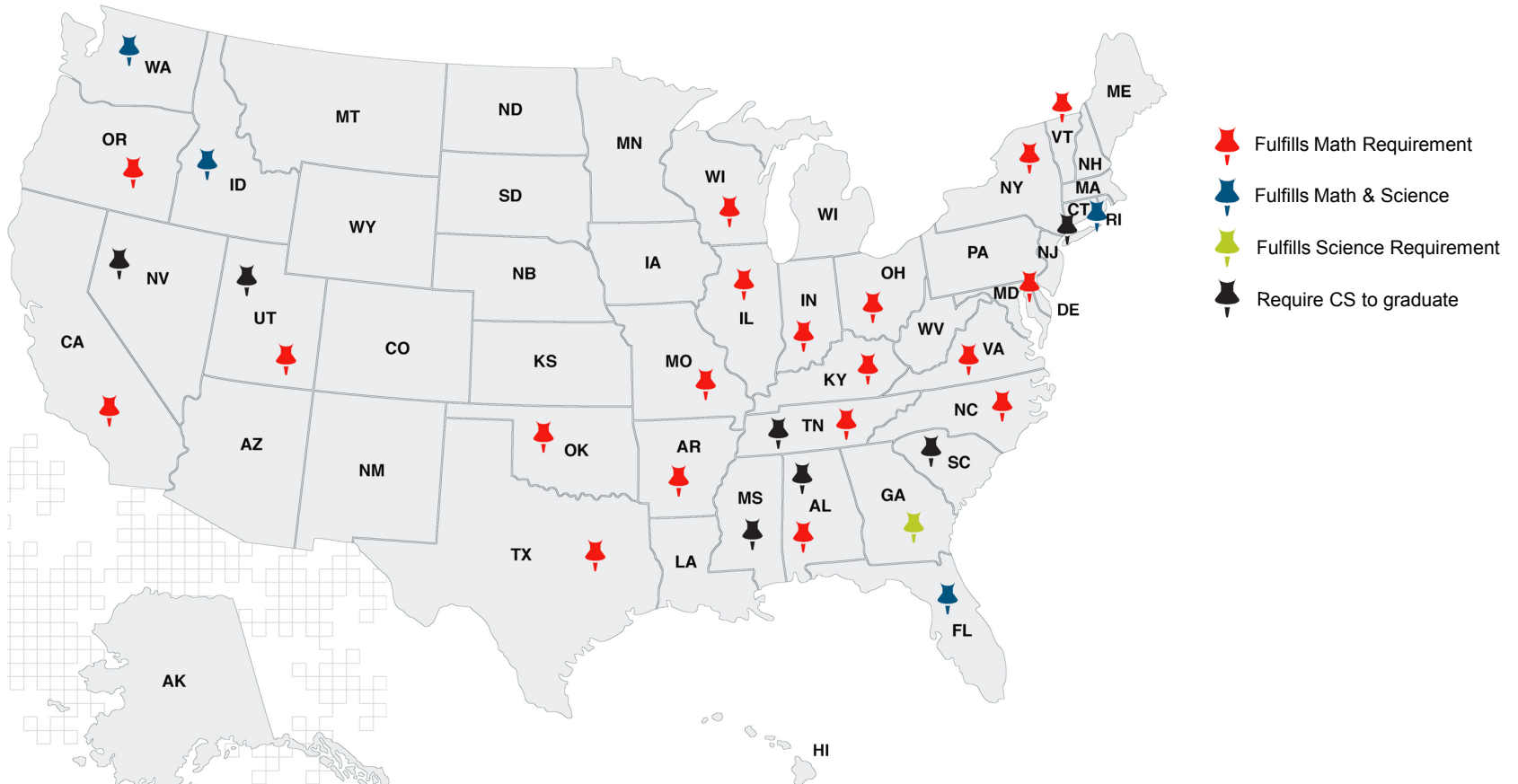
Source: code.org/promote

Course and Exam Details

About the Course

AP Computer Science Principles offers a multidisciplinary approach, focusing on the creative aspects of programming.

Students will learn:

▶ Creative problem solving

▶ How to apply computational processes to analyze large data sets

▶ Programming

▶ How the Internet works and important cyber security issues

▶ Impacts of computing innovations

"Every student has this ability to create things that they didn't even imagine they could create. And when they do, it starts to draw them in and inspire them to think well beyond what they even imagined."
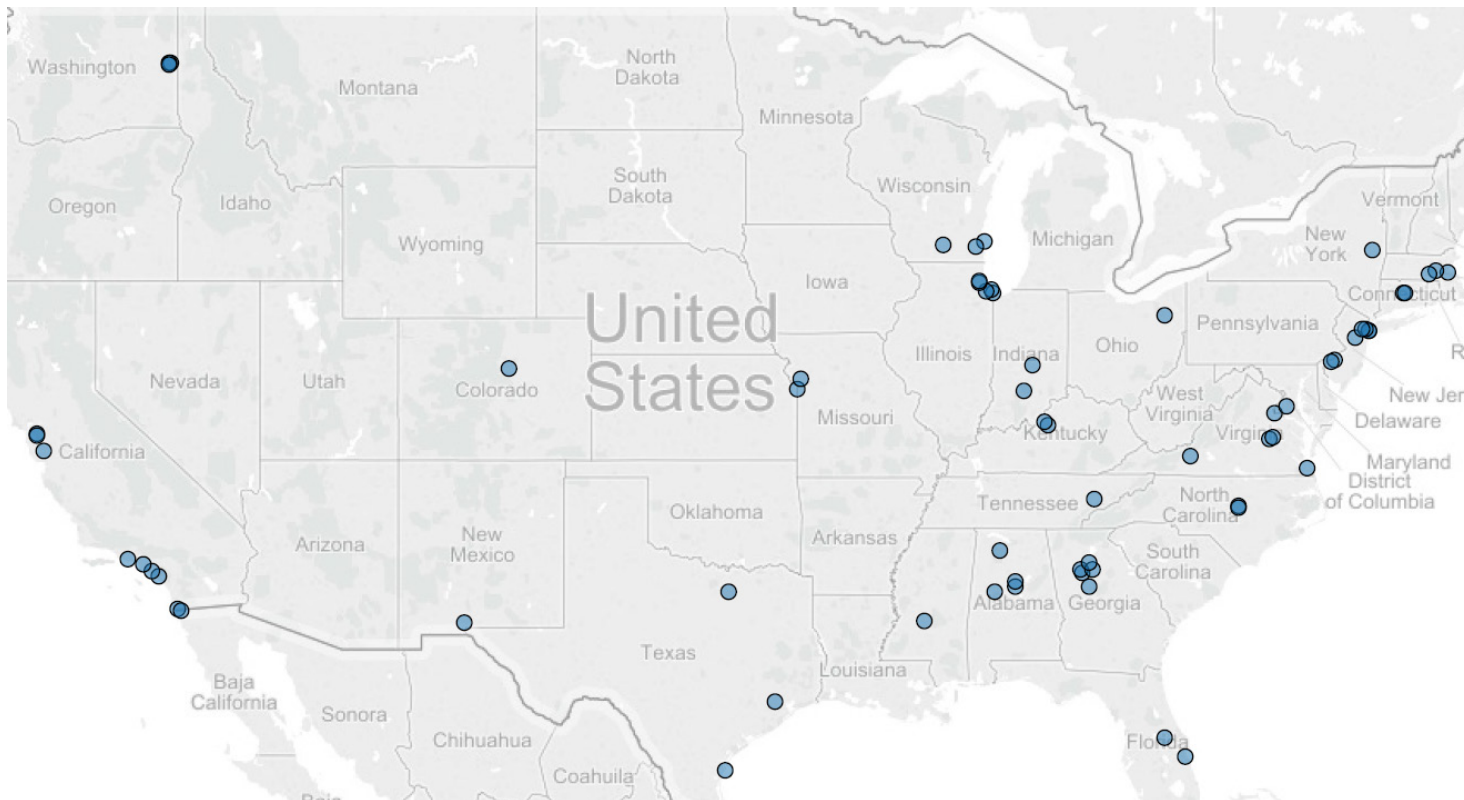
—Richard Kick

AP® Computer Science Principles Teacher

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AP® CSP Pilot Sites: 2013-2016

Map of phase II pilot sites that are evaluating the current version of the curriculum framework and the performance tasks.

Source: http://www.csprinciples.org/home/pilot-sites

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Two AP® Computer Science Courses

	Computer Science A	Computer Science Principles
Curricular Focus	Problem solving and object-oriented programming	Big ideas of computer science (including programming)
Programming Language	Java	Teachers choose
Course Goal	Encourage skill development among students considering future studies & career in computer science or other STEM fields	Encourage broader participation in CS & STEM, including AP CSA
Assessment Experience	▶ Multiple-choice and free-response questions	▶ Multiple-choice exam ▶ Two performance tasks administered by the teacher, and students submit digital artifacts

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Overview of Curriculum Framework

Big Ideas

1. Creativity

2. Abstraction

3. Data and Information

4. Algorithms

5. Programming

6. The Internet

7. Global Impact

Overview of Assessments

Through-Course Assessment (Weight = 40%)

Performance Task	Individual Weight
Explore: Implications of Computing Innovations	16%
Create: Applications From Ideas	24%

End-of-Course AP® Exam (Weight = 60%)

Item Type	Number	Timing
Multiple Choice (Single- and multiple-select)	74 questions	120 minutes

Bring AP® CSP
to Your School

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Bring AP® CSP to Your School

Creative Thinkers Wanted

Introducing
AP® Computer Science Principles
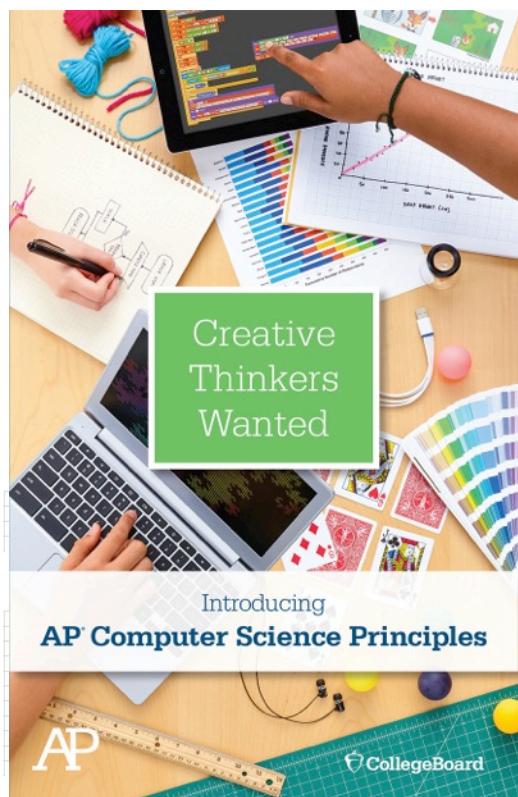
1. **Add the course to your catalog**

2. **Recruit Teachers** – teachers in disciplines other than CS can teach this course

3. **Choose a Curriculum** – develop your own or explore CSP partners

4. **Submit Course Audit Info** – Opens March 2016

5. **Check Recommended Classroom Resources** – make sure your school/classroom aligns with course recommendations

6. **Recruit Students** – especially those underrepresented in Computer Science

7. **Stay Connected** – sign up at collegeboard.org/CSPinterest

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Teaching the Course

▶ AP Computer Science Principles can be taught by Computer Science teachers and teachers in other disciplines.

"AP CSP provides the teacher with just as much opportunity to explore their own creativity and thought processes as we hope to instill in our future discoverers."

— **Brian Fuschetto**

AP® Computer Science Principles Teacher

AP® Professional Development Support

AP Summer Institutes (Summer 2016)

► Week-long professional development sessions

► Available for new and experienced Computer Science teachers

One-Day Workshops (Fall 2016)

► Available for new and experienced Computer Science teachers

collegeboard.org/CSPworkshop

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Options to Adopt CSP Curriculum and PD

► CE21 and STEM+C National Science Foundation (NSF)

- Beauty and Joy of Computing

- Mobile CSP

- Thriving in Our Digital World

► Code.org

► Project Lead The Way

collegeboard.org/CSPschool

AP Course Audit

Opens March 2016

► Provides AP teachers and administrators with clear guidelines on curricular and resource requirements that must be in place for AP courses.

► Gives colleges and universities confidence that AP courses are designed to meet the same clearly articulated college-level criteria across high schools.

► More than 126,000 AP teachers in more than 15,000 high schools have completed the rigorous review process conducted by college and university faculty on behalf of the College Board.

► As a result of the AP Course Audit, admissions officers and college faculty can be assured of the rigor of the courses that carry the AP label on student transcripts.

Check Recommended Classroom Resources

► Each student has access to course materials

► Each student has individual access to a computer (i.e., one student per computer) for an adequate time to complete course activities

► Each student has access to the Internet as well as to the tools and programming environments used in the course

► Ideally, students have access to support multi-media explorations such as 3D graphics and sound

Recruiting Underrepresented Students

1. **Focus** on the course being demographically representative of school population.

2. **Recruit clusters of students** from groups that have been historically underrepresented in computing.

3. **Extend an invitation** to all students to enroll in CSP.

4. **Encourage current students** to showcase computing projects, and advocate for computer science in school events.

5. **Reach parents by providing** course information sheets in multiple languages.

6. **Reach counselors by providing** descriptions of the course creativity, communication and collaboration.

Strategies drafted by Joanna Goode from the University of Oregon and co-author of Stuck in the Shallow End.

Online Resources

AP CSP Website

Links to:

► Introduction video

► Interest form

► AP CSP Teacher Community

► Curriculum Framework

► AP student site

Collateral (Coming Soon on the Web)

► Teacher/administrator brochure

► Parent/student flyer

► *Bring AP CSP to Your School* flyer

collegeboard.org/APCSP

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Resources in Development

Coming March 2016

► Course and Exam Description

  - Curriculum Framework (Available Now)

  - Through-Course Assessment Implementation Guide

► Curricular and Resource Requirements

► Sample Items

► Full Practice Exam – *accessible when AP course authorization has been received*

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More questions?
Web: **collegeboard.org/APCSP**
Email: APCSP@collegeboard.org