Expand with Impact: Using AP Computer Science Principles to Strengthen Student Readiness

Create new on-ramps for students taking additional AP courses in high school.

January 19, 2022
Teachers Say **Learning Gaps** Impact Participation in AP

Of the teachers expecting enrollment declines:

- **58%** say learning gaps impact participation

“Many students don’t have confidence in their math ability because they had almost a full year online. I believe there will be a lot of gaps in knowledge.”

“The pandemic has affected the proficiency of students, and they’re not confident that they can handle the AP curriculum or its workload.”

**Source**: AP Survey Findings, January 2021.
Fewer Georgia Students are Completing their AP Journey

In comparing Student Enrollment in AP Classroom vs. Examinees:

72.5% of Georgia students completed their AP Journey in 2021

- Research shows that when students are given **access to advanced coursework** opportunities, students:
  - Work harder.
  - Engage more in school.
  - Have fewer absences / suspensions.
  - Graduate at higher rates.

  (EdTrust, 2019)

- AP Classroom was built to help address student confidence. The percentage of Georgia teachers using AP Classroom aligns with those taking the exams.

- **Georgia supports students through continued AP exam funding.**
These webinars are recorded and archived on the GaDOE College Readiness website

**August 18 & 19, 2021**
Starting the year off right with APRO and AP Classroom; A look at resources to support you

**October 20, 2021**
Best practices from school and district leaders in using AP Classroom

**December 1, 2021**
Accessing and using PSAT and SAT data to support student learning and instruction

**January 12, 2022**
Learn about how to use Seminar to strengthen your AP programs – and why it appeals to students.

**January 19, 2022**
Use AP CSP to strengthen and diversify AP and CTAE programs while building a pipeline towards STEM careers

**January 26, 2022**
A roundtable session of GA AP leaders sharing how their schools and districts support AP and grow their programs

**February 9, 2022**
AP Potential: Promoting Equity and Access to Georgia's Advanced Placement Programs
Topics

- AP Computer Science Principles Program Information
- AP CSP in Georgia
- AP CSP Best Practices – District and School
- AP Reminders
- Q & A
Expand with Impact

AP Computer Science Principles

Drive diversification of computer science.
Build the pipeline to the college major.
Why is CS Important?

Consider these questions:

• How is technology influencing most career paths?

• What computer science skills will your students need when they enter the workforce?

• What concerns do you have, if any, about the availability of computer science courses in your area?
Employment in computer and information technology occupations is projected to grow 11 percent from 2019 to 2029, much faster than the average for all occupations.

These occupations are projected to add about 531,200 new jobs.

Demand for these workers will stem from greater emphasis on cloud computing, the collection and storage of big data, and information security.

https://www.bls.gov/ooh/computer-and-information-technology/home.htm
A computer science major can earn 40% more than the average college student.

Source: Code.org
Computer Science is Everywhere

Datamation
AI in Agriculture: Sustainable AI Farming 2021
How the Agriculture Industry is Using AI ... Artificial intelligence (AI) with machine deep learning and data mining and another modern computer.

CNBC
JBS cyberattack: From gas to meat, hackers are hitting the nation, and consumers, where it hurts
Published Wed, Jun 2 20211:19 PM EDT ...

Computerworld
The cutting edge of healthcare: How edge computing will transform medicine
It could enable real-time management of medical equipment as the ... Weisong Shi, a Wayne State University computer science professor and an...
Research findings for AP CSP

AP Computer Science Principles and CS / STEM Diversification

Diversification
CSP is the first AP STEM Exam for many Black, Hispanic, and first-generation students.

STEM Persistence in HS
CSP students are more likely to take AP STEM and AP CS courses in high school.

Majors in College
CSP students are more likely to major in STEM and CS in college.

CSP as an Introduction to AP STEM

CSP is the first AP STEM Exam for many Black, Hispanic, and first-generation students.

The Percentage of CSP Students for Whom AP CSP is their First AP STEM Course

- Overall: 51%
- Female: 48%
- Asian: 38%
- Black: 68%
- Hispanic: 59%
- White: 50%
- First Generation: 60%
STEM Persistence

CSP students are 4.7 percentage points more likely to take AP STEM Exams in high school than otherwise similar non-CSP students.

For all student groups, CSP students are more likely to take a STEM AP than non-CSP students.

Note: Horizontal axis numbers in parentheses are the percentage of the non-CSP students in the subgroup who take the AP STEM Exams. For example, 60% of non-CSP students take AP STEM, while 64.7% of CSP students take AP STEM for a 4.7 percentage point increase associated with CSP participation.
CS Persitence

CSP students are 14.3 percentage points (pp) more likely to take an AP CSA Exam in high school than otherwise similar non-CSP students.

While all groups of CSP students are more likely than non-CSP students to take AP CSA, the difference is most notable for Black students.

Note: Horizontal axis numbers in parentheses are the percentage of the non-CSP students in the subgroup who take an AP CSA Exam. For example, 18.2% of non-CSP students take AP CSA, while 32.5% of CSP students take AP CSA for a 14.3 percentage point increase associated with CSP participation.
STEM Major Declaration

CSP students are 11.6 percentage points more likely to declare a STEM major in college than otherwise similar non-CSP students.

CSP students are more likely to major in a STEM field, particularly Black, Hispanic, and first-generation students.

Note: Horizontal axis numbers in parentheses are the percentage of the non-CSP students in the subgroup who declare a STEM major. For example, 37.3% of non-CSP students declare a STEM major, while 48.9% of CSP students declare a STEM major for a 11.6 percentage point increase associated with CSP participation.
CS Major Declaration

CSP students are 11.7 percentage points more likely to declare a Computer Science major than otherwise similar non-CSP students.

Note: Horizontal axis numbers in parentheses are the percentage of the non-CSP students in the subgroup who declare a CS major. For example, 5.2% of non-CSP students declare a CS major, while 16.9% of CSP students declare a CS major for a 11.7 percentage point increase associated with CSP participation.
Teachers love student enthusiasm for AP CSP

“The collaborative and exploration aspect of the curriculum helped me to create an atmosphere in which the students were truly interested and excited to learn.”

“Student enthusiasm ... they loved AP CSP. Several said it was the best class they had ever taken.”

“Student engagement and interest in the subject matter was amazing.”

“One of the aspects that went well this year is the student engagement. ... I was very surprised when some of them said it was their favorite class, and it was from students I did not expect.”
## Two AP Computer Science Courses

<table>
<thead>
<tr>
<th></th>
<th>AP Computer Science A</th>
<th>AP Computer Science Principles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Curricular Focus</strong></td>
<td>Problem solving and object-orientated programming</td>
<td>Big ideas of computer science (including programming)</td>
</tr>
<tr>
<td><strong>Programming Language</strong></td>
<td>Java</td>
<td>Teachers choose</td>
</tr>
<tr>
<td><strong>Assessment Experience</strong></td>
<td>• Multiple-choice and free-response questions</td>
<td>• Multiple-choice exam</td>
</tr>
<tr>
<td></td>
<td>• One performance task administered by the teacher, and students submit digital artifacts</td>
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</tbody>
</table>
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.

“It is an exploratory class that my students say is the best part of their day. They have shown creativity, ingenuity, and a collegiality collaboration I have not had in other courses I’ve taught.”

— Becky Byer, AP Computer Science Principles Teacher from Wyoming
Exam Overview

- The AP Computer Science Principles Exam assess student understanding of the **course content** and **skills** outlined in the Course and Exam Description.

- The end-of-course AP exam is **120 minutes** in length.

- Teachers must allow **12 hours** of class for students to complete the **Create Performance Task**.

<table>
<thead>
<tr>
<th>Section</th>
<th>Question Type</th>
<th>Number of Questions</th>
<th>Exam Weighting</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Multiple-choice questions</td>
<td>70</td>
<td>70%</td>
<td>120 minutes</td>
</tr>
<tr>
<td></td>
<td>Single-select</td>
<td>57</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Single-select with reading passage about a computing innovation</td>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Multi-select</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Create Performance Task</td>
<td>1</td>
<td>30%</td>
<td>At least 12 hours of class</td>
</tr>
</tbody>
</table>
Endorsed Providers and Teacher Support
What Are AP Endorsed Providers?

- Independent organizations who provide
  - ✓ a complete curriculum
  - ✓ professional development
  - ✓ a syllabus

that are aligned to an AP course.

- Must pass a thorough review, conducted by external consultants and Course Lead(s)
AP CSP Endorsed Providers in 2021-22 Academic Year

There are AP CSP endorsed providers, offering AP CSP resources and professional development across the country.

- Apple
- Beauty and Joy of Computing
- CodeHS
- Code.org
- CS Matters
- CS50
- Microsoft MakeCode
- Mobile CSP
- Popfizz CS
- Project Lead The Way
- Project STEM
- Tynker
- UTeach
- Zulama by Carnegie Learning

[Provided links for more information]
Considerations for Selecting a Provider

The needs of individual teachers and their students are unique. Luckily, each of our providers take a unique approach to AP CS Courses, fulfilling the wide range of experience and CS background of our teachers and students.

Expected delivery
- Is the curriculum designed to be fully delivered by the teacher or is it a hybrid delivery approach?

Professional development
- What is the PD model and length?
- Will this model be sufficient for where I’m starting from?
- What am I expected to know prior to PD session?

Programming language (AP CSP)
- What provider utilizes a language I know?
- What provider utilizes a language I can quickly learn?
- Does the PD get me started in learning a new language?
- Will our computers/devices support the language of the provider?
- Will the language be too easy or too challenging for my students?
Considerations for Selecting a Provider

The needs of individual teachers and their students are unique. Luckily, each of our providers take a unique approach to AP CS Courses, fulfilling the wide range of experience and CS background of our teachers and students.

Curriculum focus
- Does the focus of the curriculum align with how I want to teach the course?
- Will the focus resonate with my students?
- Does the curriculum provide opportunities for students to engage in real-world problem solving?

Ongoing support
- How much support will I need throughout the year to implement this program?
- What level of support can I expect from the provider throughout the year?

Long-term costs
- Are there long-term costs for a particular provider?
- Has my administration signed off on any long-term costs?
College Board Support for Teachers of All Levels of CS Experience

**AP Summer Institutes**
- 70 weeklong professional development sessions.

**AP Online Workshops**
- A combination of live and on-demand sessions led by expert AP teachers.

**AP Mentoring**
- Online, teacher-to-teacher support for AP teachers provided over the course of the school year: collegeboard.org/apmentoring.

**AP CSP Teacher Community**
- Access curriculum resources, instructional resources, lesson plans, and more.

**AP Classroom**
- Repository of formative and summative questions as well as instructional videos on each topic of the course.

AP Computer Science Principles (CSP) for Georgia Schools & Districts
AP CSP in Georgia

- Currently in **264** Georgia High Schools
- Was the 14\(^{th}\) most popular course in 2021
- Had the 10\(^{th}\) highest percentage 3+
- 29.5\% of participants were **female**
- 25.4\% were **underrepresented minorities**
- AP CSP adoption has doubled in GA since 2016 when it was launched.

2021 Administration in Georgia Public Schools
- **4,028** AP Seminar Examinees
- 75.1\% scores of 3+

\(^1\) http://archives.gadoe.org/_documents/doe/legalservices/160-4-2-.48.pdf
Senate Bill 108 requires that by the beginning of the 2024-2025 school year, all high schools in local school systems should offer a course in computer science. Both AP CSP and AP CSA meet this requirement.1

AP Computer Science Principles meets the fourth mathematics or fourth science high school graduation requirement.2 Two sequential courses can also satisfy two foreign language credits.

USG will accept AP CSP as a fourth science but not a fourth math. They will accept the foreign language credits provided the student isn’t majoring in a classical language.

AP CSP is part of multiple CTAE pathways in the IT Cluster.3

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1 https://www.legis.ga.gov/legislation/54971
3 https://www.gadoe.org/Curriculum-Instruction-and-Assessment/CTAE/Pages/cluster-IT.aspx
While the Georgia legislature has passed Senate Bill 108, currently, only 28% of public high schools in Georgia offer AP Computer Science.

AP CSP serves as a stepping-stone to other advanced STEM coursework. For the class of 2019, AP CSP was the first AP STEM course for more than half of CSP students, and even more so for underrepresented students:

- Black students (68%)
- Hispanic students (59%)
- First-generation students (60%)

Low-income students are the least likely to be enrolled in CS courses.
Expand the AP Pipeline

Designed to attract a more diverse group of students by focusing on collaboration, creativity, and student choice in selection of projects.

Students indicate that they select AP CSP because it allows them to apply their learning in a hands-on environment—and it looks like fun.

And research demonstrates:

- AP CSP is attracting a more diverse set of students, and it’s the fastest-growing AP course.
- AP CSP prepares students to succeed in subsequent college-level computer science courses, and the majority of students earn a 3 or higher.
- AP CSP students are more likely to pursue STEM and computer science courses in high school and college.
More on Scheduling and Staffing

AP CSP is multidisciplinary and can therefore be scheduled and staffed flexibly.

- Schools have full autonomy on scheduling and staffing AP CSP.
  - AP doesn't specify an academic department.
  - AP doesn't require teachers to have specific teaching certifications.

- A Computer Science Certification or a Computer Science Endorsement are required for a teacher to be considered “in-field” while teaching.
  1. Teachers can opt to take the Computer Science GACE and upon passing will be credentialled as “In-field.”
  2. For endorsement, teachers can enroll in various programs throughout the state (many through RESAs) and complete roughly 15-20 credit hours.

Department Assignments for AP CSP (2021 AP CSP Teacher Survey)

- **45%** Mathematics
- **41%** Computer Science
- **31%** Technology
- **22%** CTE
- **12%** Science
Dr. Andrew Kutscher
Supervisor | Advanced Learning
Cobb County School District
Dr. Jeff Kent
Teacher, AP Computer Science Principles
Wheeler High School
Bring AP CSP to Your School

1. Recruit Teachers and Add Course—teachers in disciplines other than computer science can teach this course

2. Explore Endorsed Providers

3. Check Recommended Classroom Resources—make sure your school/classroom aligns with course recommendations

4. Recruit All Students—including females and students of color (use the AP CSP Toolkit)

5. Submit Course Audit Info—Course Audit opens in March

6. Stay Connected—sign up at collegeboard.org/CSPinterest

School leaders should consider state or local requirements for department credit or teacher credentialing when scheduling and staffing AP CSP.
AP CSP Toolkit

collegeboard.org/cspresources

• Student Testimonial Videos
• Best Practices for Implementation
• Recruitment Strategies for Diverse Class
• Brochures for Students and Parents
• Posters
• Email and Presentation Templates
• Banner Ads
Teacher AP Summer Institutes Scholarships

Apply for a 2022 APSI Scholarship

Applications are open for 2022 AP® Summer Institute (APSI) Scholarships. These scholarships cover some or all of the cost of attending an APSI. This year the College Board is offering the three competitive scholarship programs; visit the APSI Scholarships homepage to learn more about each scholarship and how to apply:

**AP Fellows** *(application deadline - 2/14/22)*
- Provides scholarships of up to $1,000 to AP teachers at schools serving underrepresented and/or low-income students

**AP Rural Fellows** *(application deadline - 2/14/22)*
- Provides scholarships of up to $1,500 to AP teachers at rural schools serving low-income students

**AP Capstone** *(application deadline – 3/4/22)*
- Provides scholarships covering tuition for AP Capstone™ professional development to AP Capstone teachers at schools meeting specific criteria
## 2022 AP Exam Schedule

The complete schedule is posted on AP Central®.

<table>
<thead>
<tr>
<th>MAY 2022</th>
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<tbody>
<tr>
<td>Sunday</td>
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<tr>
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<tr>
<td>15</td>
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<tr>
<td>22</td>
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</tbody>
</table>

- The 2022 AP Exams will be administered in schools as paper and pencil* exams over 2 weeks in May.
- AP coordinators are responsible for notifying students when and where to report for the exams.
- Early testing or testing at times other than those published by College Board isn't permitted under any circumstances.
- Late testing dates are available if students can't test during the first 2 weeks of May.

*As usual, AP Chinese and AP Japanese Exams are administered in schools on computers.
In-School Digital AP Exams

AP English Literature and Composition and AP World History: Modern

• This year (2021-22 academic year), a limited number of schools will administer in-school, digital exams with improvements from last year’s at-home, contingency exams.

• Accordingly, the digital testing app has been updated for in-school use (e.g., enabling proctored in-school digital exam administration, students to go back to previous questions).

• For spring 2022, 2 AP subjects will be available as in-school digital exams: AP English Literature and Composition and AP World History: Modern.

• On September 17, schools that administered either exam last year were invited to apply at: cb.org/ap-2022-digital-interest

• The AP Program notified schools selected to participate on a rolling basis, beginning in late October.

• Only schools that complete the initial school interest form and are selected will be allowed to administer in-school digital AP Exams.
# Upcoming AP Deadlines

See the *AP Coordinator’s Manual, Part 1* for more information.

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>January 18, 2022</strong></td>
<td>Deadline to submit accommodations requests and supporting documentation (if needed) through SSD Online.</td>
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<tr>
<td></td>
<td>Requests for accommodations are not submitted through AP Registration and Ordering. SSD Online is a separate system.</td>
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<tr>
<td><strong>January 31, 2022</strong></td>
<td>Deadline to approve Course Audit forms for initial submissions, renew previously authorized courses for the 2021-22 school year, remove teachers not teaching or courses not being taught during the 2021-22 school year, and add online and distance learning courses being taught during the 2021-22 school year.</td>
</tr>
<tr>
<td>(11:59 p.m. ET)</td>
<td>Download the <a href="#">AP Course Audit User Guide</a> for detailed instructions on participating in the course audit.</td>
</tr>
<tr>
<td><strong>March 15, 2022</strong></td>
<td>Deadline to order all exams for AP courses that begin after November 15 and to update fall orders. (Fees may apply for changes made to fall orders.)</td>
</tr>
<tr>
<td>(11:59 p.m. ET)</td>
<td>Schools are encouraged to submit any known cancellations by this date to ensure timely processing and accuracy of the exam shipment.</td>
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### Exam Fees


<table>
<thead>
<tr>
<th>Exam fee for on-time exam orders</th>
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<tbody>
<tr>
<td>(by November 15, 2021, for full-year and first-semester courses and exam only sections; by March 15, 2022, for courses that start after November 15)</td>
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<tr>
<td>- $96 per exam at schools in the U.S., U.S. territories, Canada, and all DoDEA schools</td>
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<tr>
<td>- $126 per exam at schools everywhere else (Note: Fees may vary for exams at College Board–authorized test centers outside the U.S.)</td>
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<tr>
<td>- $144 per exam for AP Capstone™ Exams (AP Seminar or AP Research)</td>
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</table>

<table>
<thead>
<tr>
<th>School rebate</th>
<th>$9 per exam</th>
</tr>
</thead>
</table>

| College Board fee reduction for eligible students | $34 per exam |
Georgia 2021-22 AP Exam Funding

The GaDOE will pay for one AP exam for Georgia public school students enrolled in AP courses in one of two categories:

- **Category 1** GA Public School Students enrolled in an AP course and who **individually qualify** for the College Board fee reduction (FRL). For these students, the state of Georgia will pay for one AP Exam in any subject (with the exception of AP Seminar and AP Research Exams.)
  - MUST indicate in APRO (checkbox)
  - Schools forgo the $9 College Board rebate
  - **NOT based on school FRL status or “free lunch for all”**

- **Category 2** GA Public School Students enrolled in an AP STEM course who do not qualify for the College Board fee reduction. For these students, the state of Georgia will pay for one AP STEM exam.
  - Nothing needs to be indicated in APRO
  - Schools forgo the $9 College Board rebate
  - STEM: Calculus AB & BC, Statistics, Biology, Chemistry, Environmental Science, All Physics, **Computer Science A and Principles**
AP Classroom

Easier to navigate. What teachers wanted.

AP Classroom has a new look that makes it easier to find and assign AP resources:

- With just 1 click, teachers can assign all topic questions for any topic and skill in the unit they’re teaching or reviewing.

- In just 1 place, teachers can manage all class assignments, including AP Daily videos, practice exams, and their own quizzes.

- In just 1 place, teachers get immediate access to student results through the progress dashboard and a new "gradebook-style" view of all their students' work.
AP Daily

On-demand video instruction that helps save class time.

AP Daily is a series of short videos that support student learning of all the required content and skills for a course.

AP Daily videos:

- Are available for all courses, for each topic and/or skill.
- Are easily accessible through AP Classroom, where teachers can track student completion rates by class section and by student.
- Are always visible and available to all students, including those in exam only sections.
- Can be assigned by teachers to students for use before, during, or after class as an introduction to or review of topic content and skill.
Questions?

Contact Cale at cgolden@collegeboard.org if you have questions about bringing AP CSP to your school or district.

AP Services for K-12 Educators
877-274-6474
Email: apexams@info.collegeboard.org

AP Services for Students & Parents
888-225-5427
Email: apstudents@info.collegeboard.org

Account Help for All College Board Programs
866-315-6068
Join us for our next Wednesday webinars!

• **January 12th** – 9:30 AM  
  *Expanding with Impact*: AP Seminar

• **January 19th** – 9:30 AM  
  *Expanding with Impact*: AP Computer Science Principles (CSP)

• **January 26th** – 9:30 AM  
  Expanding & Supporting your AP Program

• **February 9th** – 9:30 AM  
  Using AP Potential Reports
Thank you for all that you continue to do for Georgia students!