

# ACM SIGCSE Special Project Application Final Report

**Project: Develop Kahoot Interactive Lessons for AP CS Principles**

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## Problem Statement

College Board's Advanced Placement® Program (AP®) enables academically prepared students to pursue college-level studies with the opportunity to earn college credit, advanced placement, or both while still in high school. AP Computer Science Principles (CSP) introduces students to the breadth of the field of computer science. In AP CSP, students learn to design and evaluate solutions and to apply computer science to solve problems through the development of algorithms and programs. In 2019, nearly 100,000 students took the AP CSP Exam.

AP CSP classes are not spared from the “absent student syndrome”. More than 20 percent of students in high school are chronically absent, meaning that they miss at least 15 days of school in a year for a variety of reasons. Therefore, AP CSP teachers have to make alternative lessons plans, assignments, and assessments so that absent students still learn the important concepts to succeed in their course and on the high-stakes AP exam at the end of the school year.

AP CSP teachers need more ready-made resources for students who are absent from class. These teachers need a way to convey the most important technical concepts that absent students miss as well as a way to assess these students' learning to best prepare them for the AP exam. There are not many, if any, readily available microlearning modules to help fill in the gaps of technical content that students need to learn.

## Project Description

This project entailed the development of *Kahoot interactive lessons* that AP CS teachers can assign to students to teach, reinforce, and assess important computer science and programming concepts. These *interactive lessons* consist of terminology, a video to explain the concept(s), and checks for understanding in the form of multiple choice and true/false type questions. These *interactive lessons* cover many of the topics listed in the *College Board's AP Computer Science Principles Course and Exam Description, Effective Fall 2020*. The majority of the content for the *interactive lessons* was distilled from the Code.org Computer Science Principles curriculum, available under a Creative Commons License (CC BY-NC-SA 4.0). There is no cost to the teachers, parents, or students to use the *Kahoot interactive lessons*.

## Project Deliverables

Twelve Kahoot interactive lessons were created and published online in November 2021 for the following topics AP CSP exam topics:

- Bits and Binary Numbers
- Variables and Assignments
- Boolean Expressions & Conditionals
- Lists / Arrays
- Defining and Calling Procedures
- Functions with Parameters
- Loops
- Looping through Lists
- Working with Images
- Computer Networks
- Encryption
- The Internet: Routing with Fault Tolerance

An instructor guide was developed for classroom teachers and homeschool educators that contain a listing of and links to each of the interactive lessons. For each of the Kahoots, a no-deadline challenge was also set up and links provided so that educators could simply assign the challenge and provide the URL to the student as homework or classwork.

The Kahoot interactive lessons and the instructor guide are located on this author's "verified educator's" Kahoot account at: <https://create.kahoot.it/profiles/2e53e3e6-1808-444c-bee7-1fa35bba3534>

## Project Outreach

The following press release was sent out to

- National Home School Association (nationalhomeschoolassociation.com)
- HomeSchool.com
- Code.org

*Kahoot interactive lessons that use the Code.org AP CS Principles curriculum are now available to high school teachers and homeschool educators. Educators can use or assign these Kahoot challenges to their students to teach, reinforce, and assess important computer science and programming concepts, or duplicate and edit the Kahoots as they see fit for their students. These interactive lessons consist of terminology, videos to explain the concepts, and checks for understanding that cover many of the topics listed in the College Board's AP Computer Science Principles Course and Exam Description, Effective Fall 2020. There is no cost to teachers, parents, or students to use these resources. The collection of 12 Kahoots lessons and a PDF Instructor Guide is located on the Kahoots! site at: <https://bit.ly/CSPkahoots>*

The following article was published in the March 2022 edition of the CS Principles monthly newsletter, sent to approximately 30,000 high school teachers:

*Kahoot interactive lessons that reinforce AP CS Principles concepts*

*Kahoot interactive lessons that use the Code.org AP CS Principles curriculum are now available to high school teachers and homeschool educators. Educators can use or assign Kahoot challenges to their students or duplicate and edit the Kahoots as they see fit. These interactive lessons consist of terminology, videos to explain the concepts, and checks for understanding that cover many of the topics listed in the College Board's AP Computer Science Principles Course and Exam Description. The collection of 12 Kahoots and Instructor Guide is available at no cost [here](#).*

As of March 19, 2022, there **429 Plays** and **4.4K Players** of the 12 interactive lessons. The AP CSP exam is the first week of May 2022 so it is expected that many more teachers will also utilize these resources to help their students prepare for this high-stakes exam.

It is anticipated that this author will present a poster session at the Technical Symposium 2023 in Toronto, Canada to fulfill the reporting requirements of the grant.