Python with Robotics
AP CSP Curriculum

Unit 4 Overview

Time Required: 1 ½ to 2 weeks

This unit does not cover any missions in CodeSpace. The supplemental lessons are created to fill in some gaps needed for the Create Performance Task and AP Exam. Some lessons are unplugged, and some will use the Sandbox in CodeSpace to create programs. All lessons have slides for instruction and an activity guide. Lessons can be completed individually or in pairs or groups of three.

Unit Outline

Lists #1

This lesson introduces lists in a formal way. The AP Exam will have questions that involve lists, and the Create Performance Task has a requirement to use a list in a meaningful way. This is an unplugged lesson, and students can work in small groups to practice working with lists and list methods.

Lists #2

This lesson gives students more practice with lists. The problems are similar to Lists #1, but add complexity with each problem. The last problem uses two loops with lists. Students will need to work carefully. This is an unplugged lesson, and students can work in small groups to practice working with lists and list methods.

Lists with CodeBot

Students will create a program that uses a list and accesses its elements. They will learn three ways to do this. Then they apply that knowledge to a previous program. This lesson requires a computer and CodeSpace. It can be completed individually or with pair programming.

Traversing a List

Students continue their study of lists by using iteration to traverse a list. They start by traversing a single list, and then look at other variations of traversing a list. Then they apply that knowledge to a previous program. This lesson requires a computer and CodeSpace. It can be completed individually or with pair programming.

For Loop Practice

Students are given additional practice in using for loops for iteration. They return to three previous programs and modify them in CodeSpace to use a for loop. They also add a list of tuples to a program and use a for loop to traverse the list.

Functions, Parameters and Variables

This lesson pulls together functions. It reviews parameters and dives deeper into local and global variables. This concept is important in computer science in general and AP CSP specifically. They need to be familiar with this information for exam questions and written response prompts for the Create PT. This is an unplugged lesson.

Unit 4: End of Unit Assessment

A remix is not given for this unit. A question bank of possible questions from each lesson is available, and a test can be given by selecting questions from the question bank.

Unit Resources

Use these resources throughout the unit. You can add to the document as needed.

- Unit 4 Review and Test Questions

Assessment

Student mastery can be assessed formatively and/or summatively in many ways during Unit 4.

- Use journal entries, daily reflections, or exit tickets as formative assessment.
- Each lesson comes with an activity guide for students to complete.
- Three lessons – “Lists with CodeBot”, “Traversing a List”, and “For Loop Practice” – all have programs or program

modifications that can be submitted for assessment.
- AP CSP Create Performance Task written response prompts can be assigned at any time during the lessons.
- No Kahoot reviews or Unit 4 exams are available. However, a questions bank that covers topics from the lessons in the unit is available. You can use the questions to form mini reviews, as exit tickets, for review and to create a unit test.

Materials / Preparation

- Most assignments are best distributed and completed digitally. Prepare the assignments in the digital format that works best for your classroom.
- Most activity guides for unplugged activities are best printed so students can work collaboratively. Print these in advance.
- The slides for the lessons are downloadable as PowerPoint slides. Reformat into the digital format that works best for your classroom.
- Make sure you have CodeBots, AA batteries and cables for the students. Two students can share a CodeBot and work in pairs, or you can have 1 to 1 CodeBots.
- For “Lists #1”, you can optionally have additional materials for students to help them form a mental model. The materials can include small baggies, slips of paper, whiteboard markers, and tape.