Python with Robotics
AP CSP Curriculum

Unit 1 Overview

Time Required: 2 to 2 ½ weeks

This unit covers Mission 1, Mission 2 and Mission 3. It includes three supplemental lessons to extend learning and prepare for the AP Exam and Create Performance Task

Unit Outline

Mission 1: Welcome

This mission has only 4 objectives. Its purpose is to introduce the students to CodeSpace. If your students are already familiar with CodeSpace, you can skip this mission and unlock the next mission. An assignment is provided that lets students take guided notes during the mission and concludes with a picture of CodeSpace and asks students to label its parts.

Mission 2: Introducing CodeBot

This mission has 10 objectives. Students are introduced to CodeBot. They write a 2-line program at the end of the mission. An assignment is provided that lets students take guided notes during the mission and concludes with a picture of a CodeBot and asks students to label its parts.

Mission 3: Time and Motion

This mission has 11 objectives, but it covers quite a lot of material. It is divided into 3 lessons. Each lesson has an assignment and a review Kahoot! In between the lessons are supplemental lessons to enhance the learning and preparation for the AP Exam and Create Performance Task. Several programs are created during this mission. You can have students turn in all of the programs, or select one from each lesson.

Lesson: Binary Numbers

This lesson is an excellent one for collaboration and working in small groups. Binary numbers are introduced in Mission 3 Objective 6. This lesson extends their learning and gives students practice in converting binary and decimal numbers. This lesson is mostly unplugged, using manipulatives to help with the conversions. The CodeBot can be used to check their work by turning on LEDs, and that is kind of fun. Print out the manipulatives in advance and be familiar with how they work. Small chips or coins are needed for the first manipulative activity.

Lesson: Defining Functions

Functions are not introduced in CodeSpace until Mission 4, and then in a limited capacity. To give students a lot more practice with functions, the objectives are reworked to use functions. Students will still follow instructions in CodeSpace, but the next two lessons give additional instructions to define and use functions in the programs created during this mission.

Lesson: Functions with Parameters

This lesson immediately follows the “Defining Functions” lessons and extends the learning to parameters. Examples from the previous lesson are modified to use parameters, and students apply the concepts to current programs.

Unit 1: Review and Remix

A remix is an opportunity for students to create their own program from what they learned in the previous missions. A remix can be treated like a practice Create PT. They start from scratch and will not have CodeTrek to guide them. Students can use the planning guide to help them plan and organize their project. During the remix time, you can also review vocabulary and programming concepts from the unit.

Unit Resources

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

- Unit 1 CodeBot Python Code (by mission)
- Unit 1 Vocabulary (by mission)
- Unit 1 Review and Test Questions

Assessment

Student mastery can be assessed formatively and/or summatively in many ways during Unit 1.

- Each mission lesson comes with an assignment for students to complete.
- Each supplemental lesson comes with an activity guide for students to complete.
- The missions have Kahoot! Reviews available.
- Many programs are completed during mission 3 that can be used for assessment.
- The Unit 1 Remix project can be used for assessment.
- AP CSP Create Performance Task written response prompts can be assigned as part of the remix assignment for additional practice and/or assessment.
- Unit 1 Kahoot! Reviews for vocabulary and coding questions are available.
- Microsoft Forms tests for Unit 1 vocabulary and coding questions are available.
- The reviews and tests cover Missions 1-3 only. Additional questions have been added to the questions resource document that cover topics from the supplemental lessons.

Materials / Preparation

- Set up a class in CodeSpace
- Use the Getting in CodeSpace slides, or your own instructions, be ready to help students log in and join your class
- The assignments are best distributed and completed digitally. Prepare the assignments in the digital format that works best for your classroom.
- 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 the binary numbers lesson, print the manipulatives for Activity 2 and Activity 3.