AP Computer Science Principles Pacing Guide
Learning Python with CodeX

Semester 1

The focus of this semester is to prepare students for the Create PT. By the end of the semester (or earlier) students should complete the Create PT and upload the required documents. Second semester can then be spent on the non-programming units and practice with the written responses.

Week 1 **"Push yourself because no one else is going to do it for you."**

Date	Lesson / Mission	Resource
Day 1	Firia Labs CS Student Survey	https://forms.gle/YPxtUFuwthf3GUr6A Use this form. We can share the results with you if you like.
	Firia Labs Python Pre-Test	https://forms.gle/G5tzYeV3PnnNMFcp7 Use this form. We can share the results with you if you like.
	Intro to Computer Science Lesson	-- lesson not completed --
Day 2	Mission 1 & 2 • ***Suggestion:*** pair programming with random partners	Lesson Plan Codespace: https://make.firialabs.com/ Assignment document Instructions for students to get started (optional): Clearing the CodeX (optional): Programming journal
Day 3	Mission 3 (with RGB extension) - Light Show • ***Suggestion:*** pair programming with random partners	Lesson Plan Assignment document Mission Reminders slide deck RGB slide deck https://htmlcolorcodes.com/color-picker/ (optional): Clearing the CodeX (optional): Programming journal Review Kahoot #1 Daily reflection form -- use your link
Day 4	Mission 4 - Display Games • ***Suggestion:*** pair programming with random partners	Lesson Plan Assignment document Review Kahoot #2 Daily Reflection Form -- use your link Programming journal -- each student should have their own copy
Day 5	Mission 5 - Micro musician • ***Suggestion:*** pair programming with random partners	Lesson Plan Assignment document Analog and Digital slide deck Adding audio files slides (extension) Review Kahoot #3 (wrap-up) Meaningful Notes (optional) Daily Reflection Form -- use your link Programming journal -- each student should have their own copy

Week 2 **"Don't stop when you're tired, stop when you're done."**

Date	Lesson / Mission	Resource
Day 6	Remix #1 (from lesson 3-5) • ***Suggestion:*** pair programming with random partners	Lesson Plan Assignment Document Remix instructions slide deck Daily reflection form -- use your link
Day 7	Remix #1 (from lesson 3-5)	Daily reflection form -- use your link
Day 8	Remix #1 (from lesson 3-5)	Daily reflection form -- use your link
Day 9	Design Process and Flowcharts • ***Suggestion:*** can be done in pairs, or individually, or in groups of three at vertical non-permanent surfaces (whiteboards)	Lesson Plan Assignment Document Design Process and Flowcharts slide deck Python code to print for flowcharts Python code flowcharts (answers) Review Worksheet (print) Review Worksheet (digital) Review Kahoot #4 (flowchart shapes) Daily reflection form -- your link Programming journal
Day 10	Flowcharts to Code (2nd flowchart assignment) • ***Suggestion:*** Random pairings working at a computer to type code • ***Suggestion:*** there are 9 samples. Students are not expected to do all 9. This lesson can be done before or after Mission 6	Lesson Plan Assignment Document Instructions slide deck Review Kahoot #4 Flowchart symbols Answers folder Daily reflection form -- your link Programming journal

Week 3

Date	Lesson / Activity	Resource
Day 11	Mission 6 - Heart beat • ***Suggestion:*** Random pairings	Lesson Plan Assignment Meaningful notes slide deck Programming journal Daily reflection form -- use your own link Programming Journal (each student makes a copy)
Day 12	Mission 6 Extensions • ***Suggestion:*** Meaningful notes are introduced at the end of the lesson	--- see above ---
Day 13	Defining Functions Functions are formally introduced until Mission 9. However, this is an important concept for AP. This lesson introduces a basic function (no parameter).	Lesson Plan Assignment Instructions slide deck Sample code for mission 3, 4 and 6 • Folder with code
Day 14	Defining Functions (continued) *-- Can also do Kahoot reviews if time allows*	--- see above ---

Day 15	Mission 7 -- Personal Billboard This mission introduces lists -- very important!	Lesson Plan Assignment Meaningful notes slide deck Daily reflection form

Week 4

Date	Lesson / Activity	Resource
Day 16	List Practice #1 This lesson is designed to be between mission 7 and mission 8 for practice with lists and developing a shared mental model. This lesson is unplugged.	Lesson Plan No assignment for this lesson; group work Lists Vocab slide deck Examples A & B for printing
Day 17	Mission 8 -- Answer Bot This mission also uses a list. During a block class, you will have time for the extensions and challenges (or you can extend to a second day) • ***Challenge***: add images to the answer bot	Lesson Plan Assignment Adding JPG images (slides) Adding JPG images (doc) Daily reflection form Mission 8 code solution Mission 8 after challenges
Day 18	Mission 8 (extensions)	--- see above ---
Day 19	List Practice #2 This lesson is designed to be given after Lists Practice #1 and can be after mission 8. Students will continue with their shared mental model and manipulate lists through code snippets. This lesson is unplugged.	Lesson Plan Assignment (for warm up and review) Lists Vocab slide deck Examples C, D, E for printing
Day 20	Types of Division This unplugged lesson introduces modulo division. It isn't required for any programs, but is useful for the AP exam. It can be taught at any time and doesn't have to follow mission 8.	Lesson Plan Assignment (for review) Slides for instructions Document for printing examples (if needed) Kahoot review - Types of Division

Week 5

Date	Lesson / Activity	Resource
Day 21	Remix #2 (after Missions 6-8) Students use what they have learned to create their own projects.	Lesson Plan Assignment Remix slide deck Daily reflection form
Day 22	Remix #2	--- see above ---
Day 23	Mission 9 - Game spinner Functions are formally introduced and used in this lesson. Parameters will be used. This is a longer lesson and will probably need two class periods.	Lesson Plan Assignment Daily reflection form Mission 9 code

Day 24	Mission 9	--- see above ---
Day 25	Missions Exam (3 parts - MC, flowchart, code) Midterm or Semester Exam	Teacher Notes (including review suggestions) Part A - Multiple Choice Part B - Code to Flowchart Part C - Flowchart to Code Part B & Part C together

Week 6

Date	Lesson / Activity	Resource
Day 26	Mission 10 - Reaction Time The end program is a game that uses the computer's internal clock. It is referred to in the future as part of the Create PT Prep.	Lesson Plan Assignment Daily reflection form Mission 10 code (with more functions Mission 10 (from lesson)
Day 27	Mission 11 - Spirit Level This program is great fun. It is not needed for the Create PT. You have the option of assigning this mission later, after the Create PT, if you want.	Lesson Plan Assignment Daily reflection form Mission 11 - basic Mission 11 - with extensions Mission 11 - with functions
Day 28	Create PT Practice #1 This assignment starts with a basic review program and then has students add more lists. Then a function with a parameter that is used in an if statement. It includes everything but a loop, which will be added in the next practice.	Lesson Plan Assignment Instructions slide deck Program code - one topic Program code - two topics Program code w/ challenge Daily reflection form
Day 29	Create PT Practice #1 The Practice #1 may take two class periods	--- see above ---
Day 30	Traversing a List Assignment Students learn about for loops & practice writing them to traverse a list. The lesson is unplugged.	Lesson Plan Assignment Instructions slide deck Spicy Challenge solution Traversing a list solutions

Week 7

Date	Lesson / Activity	Resource
Day 31	Traversing List Program This assignment walks students through the process of writing a for loop for traversing a list. They use the same lists from practice #1. They can use the traversals lesson for review and for help, if needed.	Lesson Plan Assignment Instructions slide deck Solution - part 1 Solution - part 2 Solution - part 3 w/ challenge Spicy Challenge solution

Day 32	Create PT Practice #2 This assignment completes practice #1 by combining the traversal from the previous lesson to practice #1. Then students write about it.	Lesson Plan Assignment Instructions slide deck Program code
Day 33	Create PT Practice #2 The Practice #2 may take two class periods	--- see above ---
Day 34	Functions, Parameters & Local Variables-Part 1 This lesson reviews functions and function calls. It discusses parameters and arguments. Then it gives students some guidelines for parameters and local variables. Mild and medium problems are given for practice.	Lesson Plan Instructions slide deck Activity for printing Assignment (individual) Assignment (group work) Activity Answers Check Your Understanding
Day 35	Functions, Parameters & Local Variables-Part 2 This lesson continues the instructions from part 1. It starts with a quick review from part 1. Then it goes into multiple parameters with three spicy problems. It ends with students creating a function with multiple parameters.	Lesson Plan Instructions slide deck Activity for printing Assignment (individual) Assignment (group work) Activity Answers Check Your Understanding CYU Answers Folder with code

Week 8

Date	Lesson / Activity	Resource
Day 36	Create PT Practice #3 This practice PT builds on the function, parameters and local variables lesson. It changes the program to use lists and then adds a function with a parameter, if statement and loop.	Lesson Plan Assignment Instructions slide deck Starter code (if needed) Program code solution
Day 37	Create PT Practice #3 The Practice #3 may take two class periods	--- see above ---
Day 38	Functions and Global Variables This lesson can be given before or after Create PT Practice #3. It was designed to be given after, but the pacing is flexible.	Lesson Plan Instructions slide deck Assignment Display2 starter code Display3 solution
Day 39	Create PT Practice #4 This practice builds on the same program as earlier (Display), but goes a different direction with making it meet the requirements for the Create PT. It uses Display3 as starter code.	Lesson Plan Assignment Instructions slide deck Starter code (if needed) Program code solution
Day 40	Create PT Code Segment Practice This lesson can be given earlier. Students	Lesson Plan Assignment

	should practice identifying code segments and making images of them to upload to the digital portfolio. This lesson walks them through the process.	Instructions slide deck Instructions for snipping tool Create PT Practice #2 Create PT Practice #3 Create PT Practice #4

Week 9

Date	Lesson / Activity	Resource
Day 41	Create PT Practice #5 This lesson will combine the code from two missions into one program that meets the requirements for the Create PT.	Lesson Plan Assignment Instructions slide deck Mission 6 Heart2 (if needed) Mission 7 Billboard (if needed) Program code solution
Day 42	Create PT Practice Extra This isn't required for the Create PT, but it does teach important concepts the students can use to improve their programs.	Lesson Plan Assignment (optional) Instructions slide deck Folder that has all starter code and solutions
Day 43	Create PT Practice #6 Students create a "Simon Memory" game. It will not meet all the requirements of the Create PT, but it is great starter code that students can add to for the Create PT.	Lesson Plan Assignment Instructions slide deck Program code solution
Day 44	Prepare for the Create PT Suggestions for projects based on the Create PT Practice programs. The lesson has two parts. The code prep part can be given later.	Lesson Plan No assignment to turn in Instructions for selecting a project Instructions for code prep
Day 45	Create PT 9 class hours are required for the Create Performance Task. You may want to give an outline to stay on track, or have students journal daily about their progress. By the end of the 9 hours, students should have the program completed, the video uploaded, the PDF uploaded, and the PPR uploaded.	Create PT Code Hints

More lessons to come for written-response practice with Create PT prompts.