**AP CSP CodeBot**

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| **MISSION 3 Obj 1-6 Time and Motion** | | **Time: 45 minutes** |
| **Project Goal:** Students will learn the basics of Python.  **Learning Targets**   * I can use the “Step” feature to debug a program. * I can use binary values to animate the LEDs. * I can use comments to explain my code. * I can assign data to a variable. * I can use variables to make code more efficient. | **Key Concepts**   * Computers execute code in sequential steps. * The CodeSpace debugger lets you *step* through the code one line at a time to understand what the computer is doing. * Built-in functions come from libraries, like botcore or time. * Variables can be defined to hold changing values. | |
| **Assessment Opportunities**   * Mission 3 Obj 1-6 Assignment * Submit the “SequenceLEDs” program * Submit the “Binary LEDs” program * [Obj. 1-6 Kahoot! Review](https://create.kahoot.it/share/firia-labs-codebot-mission-3-obj-1-6/d53e34d5-56ab-4962-a9e4-a6075bb90954) | **Success Criteria**   * Learn how to use the CodeSpace debugger * Flash CodeBot’s LEDs in a controlled sequence * Incrementally test code | |
| **AP CSP Framework**  **DAT-1.A** Explain how data can be represented using bits.  **DAT-1.C** Calculate the binary equivalent of a positive integer and vice versa. Compare and order binary numbers.  **AAP-1.A** Represent a value with a variable.  **AAP-3.D** Select appropriate libraries or existing code segments to use in creating new programs.  **Computational Practice 3.A** Generalize data sources through variables.  **Computational Practice 4.C** Identify and correct errors in algorithms and programs, including error discovery through testing. | **Materials**   * Mission 3 Obj 1-6 Assignment / Answers * Solution code for SequenceLEDs and BinaryLEDs * [Mission 3 Obj. 1-6 Kahoot! Review](https://create.kahoot.it/share/firia-labs-codebot-mission-3-obj-1-6/d53e34d5-56ab-4962-a9e4-a6075bb90954) | |
| **Teacher Notes**   * Objective 6 introduces binary to control LEDs. The next lesson goes into detail about binary numbers. You can revisit objective 6 after the binary numbers lesson, if needed. * Another suggestion for assessment is for students to keep a daily journal, or use a reflection form for students to process information they learned and reflect on questions they may still have. * Refer to the CodeBot Curriculum Guide for specific information about this mission. | | |