**AP CSP CodeBot**

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| **LESSON: Defining Functions** | | **Time: 45 minutes** |
| **Project Goal:** Students will learn and to define and call functions.  **Learning Targets**   * I can define “abstraction” and “function”. * I can identify places in code where a function can be defined. * I can define a function that accomplishes a task. * I can call a function in code. * I can state benefits for using functions. | **Key Concepts**   * A function is a form of procedural abstraction. It hides the details of accomplishing the task. * Abstraction is an integral part of computer science and coding. * Programmers write functions that accomplish a task. * A function can be called multiple times and in any order in a program. * A function must be called before its code is executed. | |
| **Assessment Opportunities**   * Defining Functions Activity Guide * SequenceLEDs\_functions program * NavSquare\_functions program * BinaryLEDS\_functions (challenge program) | **Success Criteria**   * Identify when code can be written as a function * Define a function * Call a function | |
| **AP CSP Framework**  **AAP-3.A** Write statements to call procedures.  **AAP-3.B** Explain how the use of procedural abstraction manages complexity in a program.  **AAP-3.C** Develop procedural abstractions to manage complexity in a program by writing procedures.  **Computational Thinking Practices 3.B** Use abstraction to manage complexity in a program.  **Computational Thinking Practices 3.C** Explain how abstraction manages complexity. | **Materials**   * Defining Functions slides * Defining Functions Activity Guide / Answers * Solution for SequenceLEDs\_functions * Solution for NavSquare\_functions * Solution for BinaryLEDs\_functions (challenge) | |
| **Teacher Notes**   * This lesson introduces functions before it happens in a Mission or CodeTrek. Functions are a vital concept for AP CSP, and students should have a lot of practice defining and calling functions. This lesson will have students modify two programs they created in Mission 3 by defining functions. * Students should do a “Save As” with each program to keep the original code. * The challenge is an extension if students have time. It is not necessary for the lesson. * The next lesson builds on the concept of functions by including parameters. Students need to finish this lesson before continuing. They will further modify their code in the next lesson. | | |