**AP CSP CodeX**

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| **LESSON: From Code to Flowcharts** | | **Time: 45 minutes** |
| **Project Goal:** Students will create flowcharts from Python code.  **Learning Targets**   * I can label the four basic symbols used in flowcharts. * I can make a flowchart that visualizes a process. | **Key Concepts**   * There are four basic flowchart symbols. * Each line or lines of Python code can be visualized as a flowchart symbol. * Sometimes it is convenient to group similar lines of Python code into a single flowchart symbol. | |
| **Assessment Opportunities**   * From Code to Flowcharts Activity Guide * From Code to Flowcharts Guided Notes * [Flowcharts Kahoot! Review](https://create.kahoot.it/share/firia-labs-ap-csp-flowchart-shapes/883d78ee-287d-46b9-bfdb-935a958f6320) | **Success Criteria**   * Name the four basic flowchart symbols and what they are used for * Create a flowchart that visualizes a process | |
| **AP CSP Framework**  **AAP-2.A** Express an algorithm that uses sequencing without using a programming language.  **AAP-2.G** Express an algorithm that uses selection without using a programming language.  **Computational Thinking Practice 2.A** Represent algorithmic processes without using a programming language. | **Materials**   * From Code to Flowcharts slides * From Code to Flowcharts Activity Guide / Answers * From Code to Flowcharts Guided Notes * [draw.io](http://draw.io) * Unit 2 Review and Test Questions * [Flowcharts Kahoot! Review](https://create.kahoot.it/share/firia-labs-ap-csp-flowchart-shapes/883d78ee-287d-46b9-bfdb-935a958f6320) | |
| **Teacher Notes**   * This lesson is better on paper than digitally. Students need space to write and draw symbols. I suggest printing the assignment for each student, or have students work in pairs or groups of 3 and print one per group. * This lesson can be done without an activity guide. Students can work in groups of 2 or 3 and do all their work on white boards. Students can also work individually and use small white boards. Or students can use PowerPoint or Google slides to create the flowcharts instead of drawing them. There are several free websites that have tools for drawing flowcharts. I used [draw.io](http://draw.io). It lets you save charts in a Google drive or download or export them. If students use any of these methods, you can skip the activity guide and use the guided notes, or any other method for assessing mastery. * You can choose to display the Python code on a large screen, print copies for each group, or have students use their own computers to view the code while creating flowcharts. * All the answer flowcharts given are just samples. Creating a flowchart is a creative process and there are many correct ways to accomplish the task. Praise the creativity of each flowchart and discuss its merits. * The challenge program is very similar to Python Code #4, but it includes incrementing a variable. Students will do this in the next Mission, but they haven’t done it yet. You can have them do the challenge as a preview of what is to come, you can help them with it, or you can skip it altogether. * If you have time at the end of class, you can use the Kahoot review on flowchart symbols. There are 15 questions. Each one gives a line of code and asks which flowchart symbol would be used to represent the code. This is a really good lesson to conclude with the Kahoot. | | |