

Algorithms & Programming: Modularity (2) Grade Band: 3-5

Grade	Standard AP.M.02
3	Modify, remix , or incorporate portions of an existing program into one's own work, to develop or add more advanced features (grade-level appropriate).
4	Modify, remix, or incorporate portions of an existing program into one's own work, to develop or add more advanced features (grade-level appropriate).
5	Modify, remix, or incorporate portions of an existing program into one's own work, to develop or add more advanced features (grade-level appropriate).

Grade	Essential Skills
3	Select one or more features from an existing computer program with teacher guidance and add the feature(s) to an original program.
4	Add a portion of an existing computer program to an original project in order to add a new element or capability.
5	Increase the complexity of an original computer program by incorporating portions of existing programs and making modifications, as necessary.

Explanation
Students will examine examples of existing computer programs and select features that they want to incorporate into their own program. In order to be successful, students must demonstrate an understanding of the original code , of the impact of adding the code to their own program, and of the modifications to borrowed code that are necessary to produce the desired effect in their own program.

Think of this as similar to....
Reuse elements of a familiar story to create a fractured fairy tale or fan fiction.

Essential Questions
Why would you remix a computer program written by someone else?
How could you use part of a computer program another person has written to make your program better?

Implementation Examples—What would this look like in the classroom?

Grade(s)	Title	Description	Link	Content Connection & Notes
3	Introduce: Synchronization	Grade 3 --Students will work in a small group to remix the program until the wait time is appropriate between the two sprites.	Introduce: Synchronization	This lesson also aligns with CS AP.PD.01.
3	Events in Bounce	Grade 3 --Students use events when programming a game (making a hand move when arrow buttons are pressed.) Students customize their game with different speeds and sounds. Note that in this example, students are modifying an existing program not adding elements to a program of their own; it is a first step to achieving the standard.	Events in Bounce	
3	Build My City	Grade 3 --Students will review key programming concepts in the Build My City project. A demo project is used to explain the design requirements and expectations. Students create their own program, modifying the demo code so that it reflects their plan. Grade 4 --Students revise the demo program and incorporate it into a program that they create so it reflects their plan. Grade 5 --Students explore what others have done and remix others' code into their project to add elements.	Build My City	This also aligns with CS AP.PD.01 and AP.PD.04. Similar skills and concepts can be used in an About Me or Superhero project.
4	Alien Dance Party with Sprite Lab	Grade 4 --Students create their own "alien dance party"; as the lesson progresses they incorporate code that they have been using to explore events in programming.	Alien Dance Party	
4-5	Introducing Variables	Grade 4 --Students will use the starter code to keep score in a game. They then use that code when they program a new game or add to an existing program. Grade 5 --Students should remix the score keeping code they develop with code from a game (can be chase game, clicker game, pong game from Scratch tutorials or another game) and make them work together to form their own game.	See page 16 of the Blue Level Workbook .	This lesson also aligns with CS AP.PD.01. It is from Introducing Variables from CSinSF.

Grade(s)	Title	Description	Link	Content Connection & Notes
5	Virtual Pet with Sprite Lab	Grade 5--Students use code that they have used during the activities to create their virtual pets. Students should work with a partner and choose two characteristics (for example: add another sprite and a background) to add to their virtual pet. Each one of the partners codes one of the characteristics and then provide the code to their partner. They can modify their partner's code as desired and should give their partner credit for the coding they did.	Virtual Pet with partner coding as described.	

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These annotations are a collaboration between [Maryland Center for Computing Education](#) and the [Maryland State Department of Education](#).