

Algorithms & Programming: Program Development (4) Grade: 4

Standard 4.AP.PD.04

Communicate and explain **program** development to peers and adults using comments, presentations, and demonstrations.

Essential Skills

Correlate the steps taken when developing a **computer program** to the final program produced.

Essential Questions

How can you explain the process used to develop a **computer program**?

How would you describe the way your goal influenced the development your computer program?

Explanation

Students will describe the process they used and explain the choices they made when developing a **computer program**. Descriptions should include the process used for **debugging** the program and the relationships between **inputs** and **outputs**. The development process can be described using comments within computer programs, **coding** journals, discussions with a teacher, class presentations, and/or blogs. Communicating about the decisions they made while coding can help others understand and use their programs.

Think of this as similar to....

Explain to your family how and why you made the breakfast you served them.

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

Title	Description	Link	Content Connection & Notes
Build My City	<p>Grade 3--The Build My City project is a project in which students will review key programming concepts. A demo project is used to explain the design requirements and expectations. Students meet in their project groups and use storyboarding to develop their ideas for their city. Students should explain their ideas and the code that they will use to carry it out. When they develop the program, they should be able to correlate their storyboard with their projects.</p> <p>Grade 4--Students will be able to correlate the specific parts of their storyboard with parts of their computer program. Use that process to locate and correct errors (debug) in their program.</p> <p>Grade 5--Students will discuss the reasons for the choices they made during the development of the program.</p>	Build My City	<p>This also aligns with CS AP.M.02 and AP.PD.01. Similar skills and concepts can be used in an About Me or Superhero project.</p>
Conditionals with Cards	<p>Grade 3--Although students may not know the word conditionals, they are familiar with the concept from their everyday lives. In this unplugged lesson using a deck of cards, students write algorithms that depend on things like a card's suit, color, or number to add or subtract points. Students should explain the game, how it is played and how points are assigned to their classmates. Students can translate the algorithm to code in Scratch or another language and add comments to the program.</p> <p>Grade 4-- Create a more complex conditional where certain cards can result in multiplication or division of the points. Demonstrate the game following a graphic to display how the algorithm for the game was developed.</p> <p>Grade 5--Create a flowchart to model the algorithm created and indicate points where debugging was necessary, as well as where inputs were used, and outputs were generated.</p>	Conditionals with Cards	<p>This lesson also aligns with CS AP.C.01. It is unplugged but can also be adapted to have students create a computer program.</p>
End of Course Project Course D	<p>Grade 4--Students build a project of their choice in Code Studio. Discuss the reasons planning is a very important part of coding a game, a drawing or any creative process. Students explain the choices they make in the planning stage, and then build their program. Once the program is built students explain how they got their program to work and the choices they made.</p>	End of Course Project Course D	

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