

Algorithms & Programming: Program Development (4) Grade: 3

Standard 3.AP.PD.04

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

Essential Skills

Using correct terminology, describe the steps taken to develop a **computer program**.

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
End of Course Project Course C	Grade 3 --Students look at projects on Code Studio to get ideas for what they can create. They complete a planning sheet by drawing and explaining how the project will work and/or what it will look like at different points in time. Explanations should include proper terminology.	End of Course Project Course C	
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	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.
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	This lesson also aligns with CS AP.C.01 . It is unplugged but can also be adapted to have students create a computer program.

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