Standard: AP.A.01   Grade: 5

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Develop, compare, and refine multiple **algorithms** for the same task and determine which algorithm is the most appropriate.

Essential Skills

Evaluate two or more **algorithms** that complete the same task to determine which algorithm is best suited for the task at hand.

Justify the choice of which algorithm is most appropriate to complete a task.

Essential Questions

What are some strategies to create different **algorithms** for the same task?

Why is it important to consider multiple algorithms for the same task?

How do we choose the most effective and efficient algorithm for a task?

Explanation

Students develop two or more **algorithms** for the same task. They confirm that the algorithms complete the desired task and modify them to be efficient and error free. Given the task at hand, who or what is performing the task, and other constraints or considerations (such as time), students compare and evaluate their algorithms to determine which is most useful and appropriate.

Think of this as similar to….

When you get dressed for school you can put your clothes on in a variety of different sequences. Why might you put your pants on before you put your shirt on? Why put your socks on before you put your pants on?

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

Title	Description	Link	Content Connection & Notes
Card Castles	**Grade 3**--Read the first six pages of How to Code a Sandcastle and then small groups of students make castle out of playing cards. Each group writes an algorithm detailing how they made their structure. Each group should compare their algorithm with at least one other group's algorithm. **Grade 4**--Each group should try at least one other group's algorithm and suggest modifications for improvement. **Grade 5**--Compare the algorithms across groups. Each group should decide which algorithm worked best for them and explain why.	[How to Create a Sandcastle](#)	ELA SL3.1, SL4.1, SL5.1
Create and compare algorithms	**Grade 3**--Students create two or more algorithms that describe how to get ready for school (or any other routine such as playing a game, getting to the nurse's office from the classroom, preparing for dismissal, etc.). Students compare and contrast the algorithms. **Grade 4**--Modify the different algorithms to support different constraints but still accomplish the same goal. Therefore, getting ready for school may include a variety of different steps along the way. Examples can include caring for a pet, making sure there is time to talk with a friend before classes start, or taking a longer route to school to accompany a younger sibling to their school first. **Grade 5**--Students evaluate the algorithms and determine which best completes the task. Write an opinion piece, justifying with reasons their selected algorithm is most appropriate to achieve the goal.		ELA W.5.1
Early Settlements	**Grade 5**--Students use a map to create multiple algorithms to model the early land and sea routes between European settlements in Maryland. Compare and refine their algorithms to achieve faster travel times, shorter distances, or avoid specific characteristics, such as mountains, deserts, ocean currents, and wind patterns. Students should justify which route (algorithm) would be most appropriate in given circumstances (for example in summer vs. in winter).		MD State Social studies standards: 5.3.C.1.b Geography:

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These annotations are a collaboration between Maryland Center for Computing Education and the Maryland State Department of Education.