Algorithms & Programming: Control   Grade: K

Standard .K.AP.C.01

With guidance, create a set of instructions (**programs**) to accomplish a task using a **programming language**, **device**, or **unplugged** activity, including sequencing, emphasizing the beginning, middle, and end.

Essential Skills

Recognize the order of a sequence of instructions or occurrences as the beginning, middle and end.

Create a logical sequence of instructions with guidance as needed.

Essential Questions

How can you show the order of a list of steps or a set of instructions?

Explanation

Students should understand that the order of steps in a set of instructions affects the outcome or end result of the project or **program**. When instructions are repeated multiple times, loops can be used to eliminate redundancy. Students can experiment with different sequences as well as different loop configurations to determine their effect on the final outcome. Sequencing terms being used in language arts can be reinforced when addressing this standard.

Think of this as similar to….

How might a story change if an event from the middle of a story happened when the story began?

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

Title	Description	Link	Content Connection & Notes
Nevertheless, They Persevered	**Grade K**- Students listen to the book More-Igami by Dori Kleber and then follow a sequence of origami instructions. Students should relate their own experience following the sequence of instructions to that of Joey in the book and note how the sequence of instructions is important to the outcome. The origami patterns may be adapted as appropriate for students. **Grade 1**- Students should be made aware of patterns in the instructions. they can also experiment with what happens if they follow the origami steps out of order. "	Nevertheless, They Persevered	This lesson also aligns with **ELA** RL.K.10
Happy Maps	**Grade K**—Students are given a maze and a character "flurb" and they work in teams to get the flurb to the fruit. Students will create precise instructions as they work to use direction arrows to help the flurb move through the maze. Students should be able to identify the beginning, middle and end of the directions that they give the flurb. If problems arise in the code, students should work together to recognize bugs and build solutions. **Grade 1**-Students should experiment with changing the order of the instructions to see if the flurb still reaches the fruit. They should use patterns in the instructions to make the instructions shorter (for example instead of "turn right and go forward then turn right and go forward" students should recognize that the instruction can be "turn right and go forward twice".)	Happy Maps	This lesson also aligns with **CS** AP.V.01 and AP.PD.04; similar activities can be done with floor robots see Code and Go Introduction
Dancing Alone	**Grade K**- Students use Scratch Jr. to create a silly dance for Scratch Cat using motion blocks. Students are introduced to creating sequences of code in Scratch Jr. Students should be able to identify the blocks at the beginning, middle and end of the program they create and in the dance the Scratch Cat does. **Grade 1**- Students should identify how the order of the motion blocks determine the order of the dance, predict how changing the order of the blocks will change the dance and test their predictions. Any patterns or repeated block sequences should be identified as such. **Grade 2**- Students should use at least one loop in the dance program.	Dancing Alone	This lesson also aligns with **CS** AP.V.01, AP.PD.01, AP.PD.03 and AP.PD.04 and is similar to Getting Loopy

Standard: AP.C.01 Grade: K

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