

K.AP.2 Algorithms and Programming



The student will plan and implement algorithms that include sequential order.

(a) Identify tasks that are completed using sequential step-by-step instructions. (b) Recall and state thoughts, ideas, and stories in the form of sequential steps. (c) Create a design document to illustrate thoughts, ideas, and stories in a sequential manner. (d) Create and test a sequential algorithm emphasizing beginning, middle, and end. (e) Create and test a sequential algorithm to accomplish a predetermined task.

Understanding the Standard

In both school and home settings, students follow step-by-step routines for various activities, like brushing their teeth or getting ready for school. Students can think of these sets of instructions as algorithms. Students should understand that algorithms have a clear beginning, middle, and end. Just as we use algorithms to complete our daily routines, we can also program computers to use algorithms for different tasks, communicating the algorithm in a specific language that computers can understand. An important skill for creating algorithms is recalling and organizing thoughts, ideas, and stories sequentially. Just as authors employ various methods to plan their narratives, such as story maps, storyboards, or graphic organizers, programmers can effectively plan, develop, and test programs by creating documents that outline their thoughts, ideas, and processes in sequential order.

Term	Definition
Sequence	An ordered set of instructions.
Algorithm	A list of steps to finish a task.
Program	An algorithm that has been coded into something that can be run by a machine.
Design Document	Written description of a program or story.

Prerequisite Knowledge

To engage with this standard, students should understand sequential order and be able to follow simple instructions. Understanding story structure is also helpful for discussions about sequencing.

Integration Opportunities

English K.C.2b,d Students speak audibly and use algorithms and programs to retell events in sequential order.

Visual Arts K.13a When creating art, students can use directional words to create a design document to illustrate ideas.

History K.5c Students can use plugged and unplugged coding to tell the stories of the people that developed their local communities.

Music K.15 Students will identify and perform rhythmic patterns.

Physical Education K.1j Have students demonstrate movements with a partner and rhythmic patterns using manipulatives such as rhythm sticks,

Summary of a Lesson

Introduce algorithms by explaining that algorithms are sets of instructions or steps that help us complete tasks. Use examples from students' daily lives, such as brushing teeth or getting ready for school. Ask students to think about their daily routine and identify three activities they perform regularly, such as feeding a pet, getting dressed, or eating breakfast. Write these activities on a whiteboard or chart paper. Divide the class into small groups or pairs. Provide each group with a set of images representing the steps involved in an everyday task (e.g., tying shoes, bedtime routine, preparing and eating a simple breakfast). Ask the students to put the images in sequential order to create a step-by-step routine, or algorithm, for the chosen activity. Students may also choose to write their own set of instructions or create their own drawings to represent each step of an activity.