

Algorithms & Programming: Variables Grade: 1

Standard 1.AP.V .01

With guidance, model the way **programs** store and manipulate grade-level data by using numbers or other symbols to represent information (e.g., encode or decode words using numbers, pictographs or symbols to letters, words, or direction).

Essential Skills

Identify and interpret symbols that are used to represent information such as mathematical operators, pictographs,

Create and use symbols to represent information such as comparative quantities, repeating patterns, a series of actions, or directions.

Essential Questions

What are examples of symbols we use to give each other information?

Why is it useful to use symbols to represent information?

Explanation

Students will model the ways computers store information by using representations for real world information. Thumbs up/down can represent yes/no, letters and musical notes represent sounds, arrows represent directions; “secret” codes can be created for letters or words using numbers or other symbols. Note: Despite the name of the standard, it is not essential to use the term variable at this stage

Think of this as similar to...

Emojis are used to let people know how you are feeling.

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

| Title | Description | Link | Content Connection & Notes |
|---------------------------|---|------------------------------------|--|
| Happy Maps | <p>Grade K-- Students are given a maze and a character "flurb" and work in teams to get the "flurb" to the fruit. Students will create precise instructions and connect the instructions with the symbols provided.</p> <p>Grade 1--Students create their own symbols and define them to others as they provide instructions to move the "flurb" to the fruit.</p> | Happy Maps | This lesson also aligns with CS AP.C.01 and AP.PD.04 ; similar activities can be done with floor robots see Code and Go Introduction |
| Dancing Alone | <p>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 demonstrate an understanding that the coding blocks determine what the Scratch Cat does.</p> <p>Grade 1--Students should be able to identify a number of the code blocks and describe what they "tell" the Scratch Cat to do.</p> <p>Grade 2: Students should look at a sequence of code blocks and describe what the Scratch Cat will do; conversely, they should be able to watch the Scratch Cat do a simple dance and be able to make a reasonable guess of a code that could be used to accomplish that dance. "</p> | Dancing Alone | This lesson also aligns with CS AP.C.01 , AP.PD.01 , AP.PD.03 and AP.PD.04 and is similar to Getting Loopy |
| My Robotic Friends | <p>Grade 1--Using a set of symbols in place of code, students will design algorithms to instruct a "robot" to stack cups in different patterns. Students will take turns participating as the robot, responding only to the algorithm defined by their peers. This segment teaches students the connection between symbols and actions, the difference between an algorithm and a program, and the valuable skill of debugging.</p> | My Robotic Friends | |

Standard: AP.V.01 Grade: 1

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