Information

An algorithm is explicit, step by step instructions to complete a task. Algorithms enable digital systems to complete required tasks. The complexity of algorithms increases as the task becomes more complicated. Certain functions can be used to reduce the amount of content written to perform the algorithm.

User interface refers to how the user will interact with the hardware and software. Interacting with the software may include creating buttons to add text, menu buttons with multiple options and pages that when clicked will accessed. Any part of the program that the user interacts with is part of the user interface. Branching is the term given to show multiple options available for the task to be completed. The direction of the algorithm will change, depending on how the task is executed. Instead of repeating the same algorithm over and over – one algorithm can be written to repeat the same task. Instead of writing out an algorithm 100 times, it can be written as one command repeated 100 times. This is called a repeat or iteration. Other common commands may include but not limited to are: when, if then, if else, setting and changing variables, while, end while.

Written algorithms can be manipulated and added to a digital software program to create a digital solution. These algorithms need to be written in a language the digital system will understand. General purpose programs that have the ability of the create an array of different problems to solve. Common general-purpose programming languages include C++, Python, Java and Ruby.

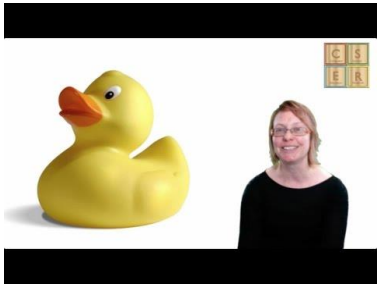
Curriculum Expectation

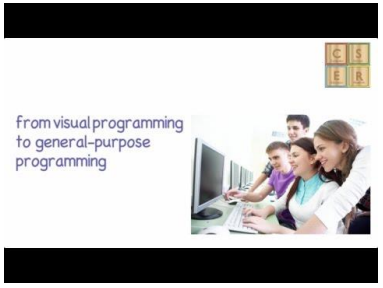
Students will write out the algorithms in structured English and flowcharts as a method to show the instructions. Programs will include user interface and prior testing will ensure possible errors are reduced. They will be given the opportunity to create digital programs using general purpose programming languages that use a range of programming functions.

Video Resources

Click the images to watch the videos

These videos explain how flowcharts are a fundamental step in algorithms and design and defines general-purpose programming and explains different types of programming languages.

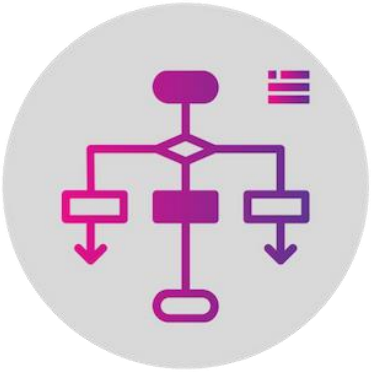




Video Source: Computer Science Research Group (CSER)

ALGORITHMS

Algorithms are explicit, sequenced steps to solve a problem or complete a task



FLOWCHARTS

Algorithms can be graphically organised as flowcharts.

Algorithms will be written to demonstrate user input (user making decisions), branching (providing multiple options) iteration (repeats) and common functions.

GENERAL-PURPOSE PROGRAMMING LANGUAGES

Written algorithms can be transferred into a general-purpose program language to create a digital solution.

General-purpose programming languages allows users to use one language to create different tasks.