# Computer Coding is Cool

Computers can only understand two types of data: on and off. As a result, there are lots of on-off switches inside of a computer. Each on-off switch is called a transistor. Transistors help electricity flow through the circuits in a computer and they turn on and off in patterns.

As transistors were being developed, so was something called a microchip. The microchip provided a place for all the electrical parts of a circuit to be located. These days, each microchip can hold millions of transistors each of which can be used in an integrated circuit. In addition, microchips also store information in the form of computer memory.

The information (memory) in a microchip is stored in a kind of "alphabet" known as binary code. Binary code takes into account the fact that computers can only produce two types of data: on and off. As we now know, these on-off patterns are produced by the transistor within each microchip.

To make this easier for humans to understand, we have assigned a symbol for "on" and a symbol for "off". While we could have chosen something like "A" for on and "B" for off, someone smartly decided to use numbers instead. Since zero already refers to nothing or zilch, it was the perfect fit to represent "off" for a computer. And since only one more symbol was needed, it only seems logical that 1 was the choice for "on". So our super simple computer code alphabet has only two letters – make that numbers.
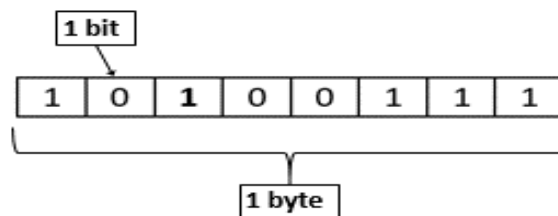
One unit of this code, either a 0 or a 1, is sometimes known as a bit. Bits are often placed into groups like the letters in a word. By grouping single bits together in larger and larger groups, computers can use binary code to find, organize, send, and store more and more kinds of information. The most common way they are grouped is into sets of eight with each set of eight is commonly known as a byte.

In this STEAM Challenge, your job is to artistically represent an important thing, person or idea in binary code. You must do this using objects to represent the 1's and 0's of this incredible code.