COMPUTERS CURRICULUM

Hardware, Software, and Programming

Computer hardware is all of the physical pieces that make up a computer system:

- Learn about computer components: processors, memory, and power.
- Learn about computer systems: desktops, laptops, and small computers.

Computer software is not physical, but is a set of instructions that a machine can read and follow:

- Learn about firmware and operating systems.
- Learn about computer applications.

Computer programming is writing instructions (code) for a computer:

- Learn about the code computer's read and the code human's read.
- Learn how to code and think like a programmer.

THE COMPUTER

- Hardware
- Software
- Programming

A computer is a machine. Inside a computer are computer components that we call hardware. Computer hardware is all of the physical pieces that make up a computer system. Hardware stores and runs computer programs.

Computer programs are called software. Computer software is not physical, but is a set of instructions that a machine can read and follow. Software tells hardware what to do. A computer needs hardware and software to be usable, and hardware and software need each other.

Computer programming is writing software (code) for a computer. Computers understand binary code, but programmers do not write in binary. Programmers write code using programming languages that are easy for humans to read, and this is reduced into binary for the computer to read.

HARDWARE

- Learn about processors: CPU, GPU.
- Learn about memory: RAM, ROM, flash memory, hard disk drive.
- Learn about the power supply.
- Learn about computer systems: desktop, laptop, smartphone, Raspberry Pi, BeagleBone, Arduino, ATtiny.
- Learn about other computer components: circuit board, motherboard, optical disc drive, battery, WiFi module, GSM module, camera, microphone, speakers, input/output pins.
- Learn about ports: USB, analog video/audio, HDMI, Ethernet, memory card slot.

SOFTWARE

- Learn about firmware and the BIOS.
- Learn about operating systems: Windows, OS X, Linux, BSD.
- Learn about applications: web browser, file manager, word processor, media player, computer game.

PROGRAMMING

- Learn about code: binary, machine code, assembly language, high-level programming languages.
- Learn to think like a programmer: sequence, decomposition, pattern recognition, algorithms, data structures, selection, creativity, abstractions, debugging, collaboration.
- Learn the fundamentals of programming: commenting code, printing text, variables, strings, numbers, booleans, user input, mathematical operators, comparators, functions, if/else statements, loops, lists, classes, file input/output, and language intricacies.