Kids said they wanted to know about Animation, Coding, Minecraft, Video Games, &

Internet

Computer Parts

-Input & Output

-Central Processing Unit

-Memory

**BRING AN ARDUINO**

Draw the data flowing through animation

-**Animation** is just multiple frames moving fast enough that our eyes perceive that an object in an image is in motion

-So how do you create an animation? You start by making models, which are things that represent the world. They’re built using vertices, edges, and faces (Draw what vertices, edges, and faces look like).

Inside a computer all of these are data and computers represent them as binary

**Bus** - Animation

A system bus connects all of the main components. A bus is a collection of wires through which data is transmitted from one part of a computer to another.

- A bus is like a highway on which data travels within a computer.

- You can think of cars as things that contain messages

How are data transported from one part to the other?

How does a controller work in a game console?

-So you can think of your computer as an information highway

-Or a human body wherein veins are the Bus and Blood

-Input output could be vision and speaking/action/writing

-You can think of cars as things that contain messages driving in the highway

-Messages are binary. Does anyone remember binary?

-Binary is just a way to represent numbers in base two, namely ones and zero

Representing high voltage & low voltage.

-Computers weren't initially designed to use binary... rather, binary was determined to be the most practical system to use with the computers we did design.

-So our car electromagnetic signal, such as an electrical voltage, radio wave, microwave, or infrared signal.

Input & output: How do we use the BUS?

Input and output is all of the communication that happens in and out of the computer. Input is the signals or data received by the computer (that is, put into the computer), and output is the signals or data sent from the computer.

-With what I just told you, can anyone guess how your keyboard works and your LCD?

Central Processing Unit:

The Central Processing Unit is like the “brain” of the computer – it’s where the stuff happens. It carries out the instructions for the computer to function by performing the basic arithmetic, logical, and input/output operations. There are three main parts to the CPU:

Does anyone know what **abstraction** is?

-Using examples to symbolize processes or rules

CPU (Volatile) – Processing each node of our animation

CPU CACHE (Volatile) - Next to be processed node,vertex,edges of our animation

PHYSICAL MEMORY (Volatile) RAM – Where we store our programs or animation when the computer is on and ready to be processed

SOLID STATE MEMORY (Non-Volatile) – Where we store our animation offline faster

Virtual Memory (File Based Memory) – Where we store our animation offline

Control Unit,

Arithmetic Logic Unit (ALU)

Memory registers

Arithmetic Logic Unit - addition, multiplication, binary manipulation, logic evaluation

-Memory Registers - holds data that needs to be processed right away for calculations usually in ALU

-Control unit - it reads and interprets instruction and determines the order of execution of instructions

--just like your scratch program

--controls communication and coordination between input and output devices, and control flow of

--data between all devices

**More Abstraction**

Go down to compile and go up to disassemble

For programming languages abstraction

So, python and is a scripting language

C++ is a high level language

Mips is an assembly language

Machine Code (Hexadecimal)

Binary Code (1s and 0s)

The closer you are to the bottom means the closer you are to the hardware

So, memory

-you could either right it down or put it somewhere in your memory

-Static electricity occurs when there is an imbalance of positively and negatively charged atoms. Electrons then jump from atom to atom, releasing energy. Two examples of static electricity are lightning and rubbing your feet on the carpet and then touching a doorknob.

Current electricity is a constant flow of electrons. There are two kinds of current electricity: direct current (DC) and alternating current (AC). With direct current electricity the electrons move in one direction. Batteries produce direct current. In alternating current, electrons flow in both directions. Power plants produce AC electric current. Alternating current (AC) is the type of electricity that JCPB distributes to you for use.

**Parts of the computer**

Hard Disk / Solid State Drives

HD

-So non volatile, doesnt need electricity to store data

-Like putting stuff in your notebook compared to putting stuff in your memory

-Contains small spinning platters that contain data and has moving parts to write data

-like a vinyl player

--SSD

----no moving parts, just like a flash drive - uses flash memory - uses grid of electric cells

to quickly send and recieve data

Real time clock/battery - offline clock

integrated circuits - are small circuits that help the motherboard

floppy disk and cd drives - like cd that store information and send

inductor- in the motherboard. so inductors that have copper wire that wraps them to create a magnetic field

. so it can store energy in its magnetic field. it tends to resist change in any current flowing through it

. so to step down power from an outlet to the low voltage required by computers.

can anyone guess what happens if we just allowed too much voltage to pass?

fans and heat sink - things to keep your computer cool and not to overheat - so

a heat sink maximizes the area in contact with a cooliing system - some use mineral oil

-why does submergin your computer to mineral oil work as a cooling system?

capacitors - in the motherboard that regulates voltage, store electrical charge so that your computer has a smooth flow of current

Ports: Connections for peripherals:

Switches:The switches allow you to override some settings, such as the clock speed!xv

Thick wiring/buses:

Thick wiring/buses are bunches of wires that carry data between different components/parts. The most

visible ones here connected the hard drive (removed) to the motherboard, and the floppy disk/CD input

to the motherboard.

PCI Expansion Slots:

Sometimes it’s nice to be able to add extra stuff to your computer, such as a dedicated sound card, a

network modem, or more USB ports. Usually, these will plug into the motherboard’s extra PCI (Peripheral

Component Interconnect) slots

Power supply:

Look for the big box that the power cable plugs directly into. This component is called the power

supply, and it’s what powers all the other parts of the computer and adjusts the voltage to match

the component it’s plugged into. It has a bunch of wires coming out of it that go to all the different

components. It takes the power from the power grid, where you plug it into an outlet, and

changes it into some different voltage levels to give the boards the amount of power it needs.

Graphics Processing Unit (GPU)/Graphics Card:

The graphics card is what’s responsible for drawing things on your screen, especially in 3D. New graphics

. Graphics cards are great for doing many small calculations very quickly, which helps with

3D rendering but also has other applications such as bitcoin mining or password cracking.

Random Access Memory (RAM): - volatile

Whenever you load up a program on your computer, it is read from your drive into RAM. That’s why

having more RAM in your computer lets you run more programs at once before your computer starts to

slow down. RAM is kind of like a hard drive, except that it’s much faster (and more expensive) because it

doesn’t have any moving parts. It is also cleared every time you turn the computer off.