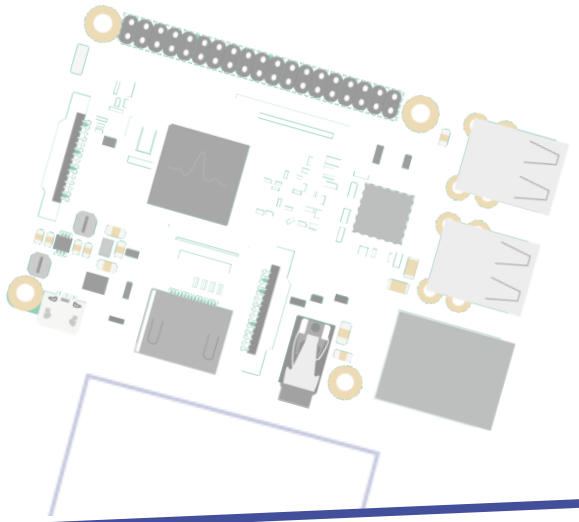
DEPARTMENT *of* COMPUTING
College of Business & Technology
EAST TENNESSEE STATE UNIVERSITY

TECHNOLOGY PRODUCT LITERACY



What's in a computer?

Professor Ryan Haas

What is a computer?

An electronic device that accepts data as input, processes it, stores it and gives out information as the output. [1]

DESKTOP PC

LAPTOP

PHONE

GAMING CONSOLE

ROUTER

SMART HOME DEVICE

1. Components of a Computer System. University of Iowa.

The Big Stuff

System Unit

The case housing all the digital electronic components that comprise a working computer. Not referring to the components themselves.

Left: A tower-style PC case. You would need to connect a display, such as a monitor, to use this one.

Right: All-in-one computers, like this iMac combine the system unit with the display. All the computer parts are housed behind the display.

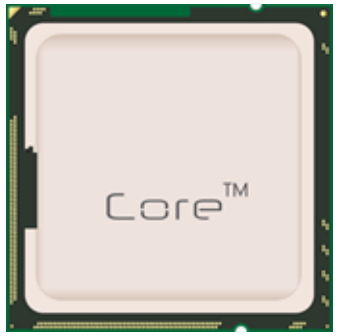
Motherboard

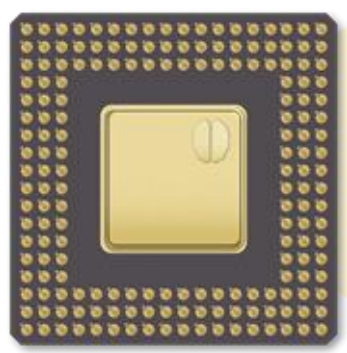
The main circuit board to which all chipsets and memory devices connect.

Chipset

The electronics on the motherboard that manage the data flow between processors, memory, & peripherals.

What is a CPU?
(Central Processing Unit)





The "Brain" of a computer.

Performs all basic operations.

"X.X GHz" = of operations per second.

Can have 1+ cores. More cores = more operations at a time.

Newer generation ➔ significantly better performance, power efficiency, newer tech.

Top right:

CPU with pins on the back – called Pin grid array (PGA) – connect to metal plates called lands on the motherboard's CPU slot.

Other CPUs have flat plates on the back – called land grid array (LGA) – for slots with pins.

What is a GPU? (Graphics Processing Unit)

Integrated Graphics:
Bundled with the CPU. More economic.

Handles displaying things to the screen.

Dedicated Graphics Card:
Sold or installed separately. More powerful.

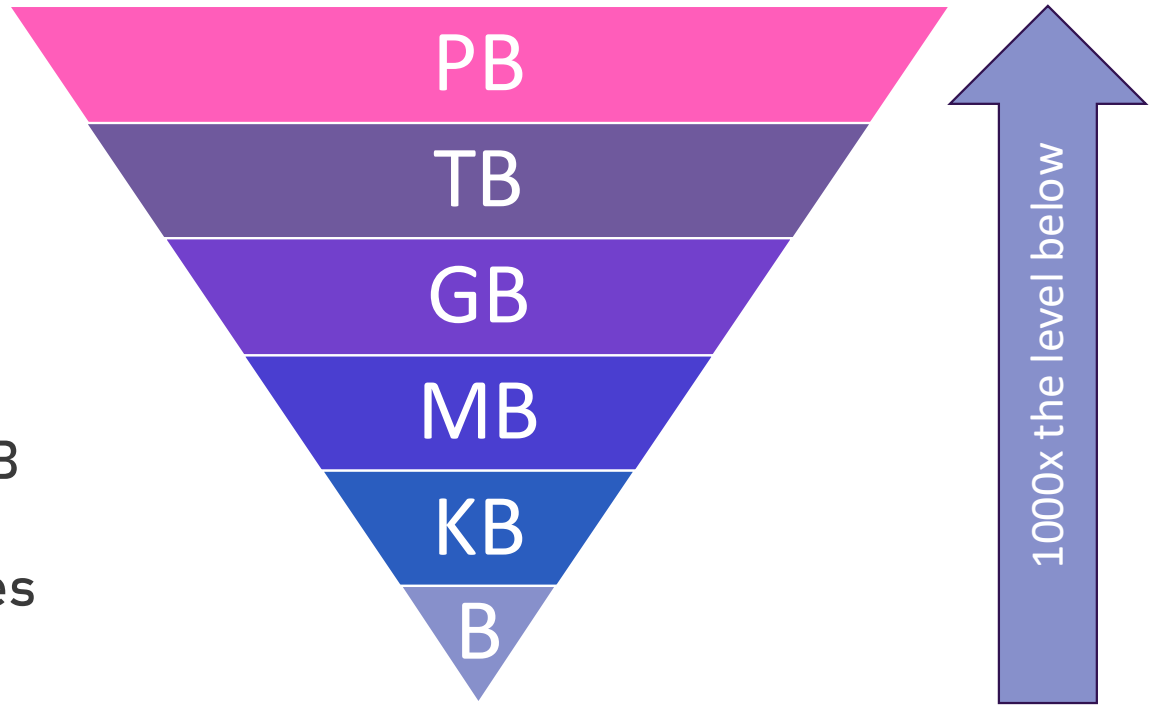
3D models, video games, and video editing take more power.

Where is my stuff? Part 1:
RAM (Random Access Memory)

- Storage for programs (Google Chrome, Siri, Call of Duty)
- Short Term – only stores current program data.
- More RAM allows for more multitasking.

Where is my stuff? Part 2: How Memory Is Measured

- 8 bits make a byte – the most basic unit of measurement in computing
  - A Petabyte (PB) is 1000 TB
  - A Terabyte (TB) is 1000 GB
  - A Gigabyte (GB) is 1000 MB
  - A Megabyte (MB) is 1000 KB
  - A Kilobyte (KB) is 1000 bytes



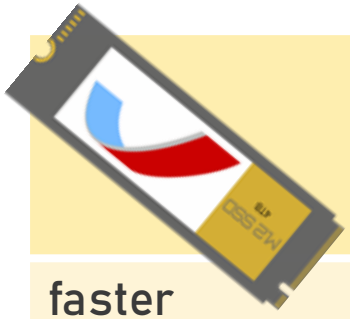
Where is my stuff? Part 3: The Hard Drive

Long term storage (Word files, programs, cat pictures) of different sizes (128GB…500GB…2TB…8TB)

Hard Disk Drive (HDD) – Cost-efficient storage, slower.

Solid State Drive (SSD) – Faster, less space, more expensive.

The Hard Drive: SSD vs HDD



SSD	vs	HDD
faster ✅		❌ slower
more expensive ❌		✅ cheaper
non-mechanical (flash) shock-resistant ✅		❌ mechanical (moving parts wear out)
best for storing operating systems, gaming apps, & frequently used files		best for storing extra data, such as movies, photos, & documents

- Some PCs and less portable laptops use both! SSD stores the operating system (MacOS, Win 11), HDD for additional bulk storage.
- An OS installed on an SSD loads much faster than it would on a HDD.
- Spinning mechanical parts are slower than electrons!

The Power Supply

Converts AC power from the wall into DC current.

Internal:

External:

💯 *Hot Tip:*

When it comes to PC power supplies, don't cheap out. Buy brand name if selecting your own. Not worth damaging your hardware or causing fire.

PC: Always use a surge protector!

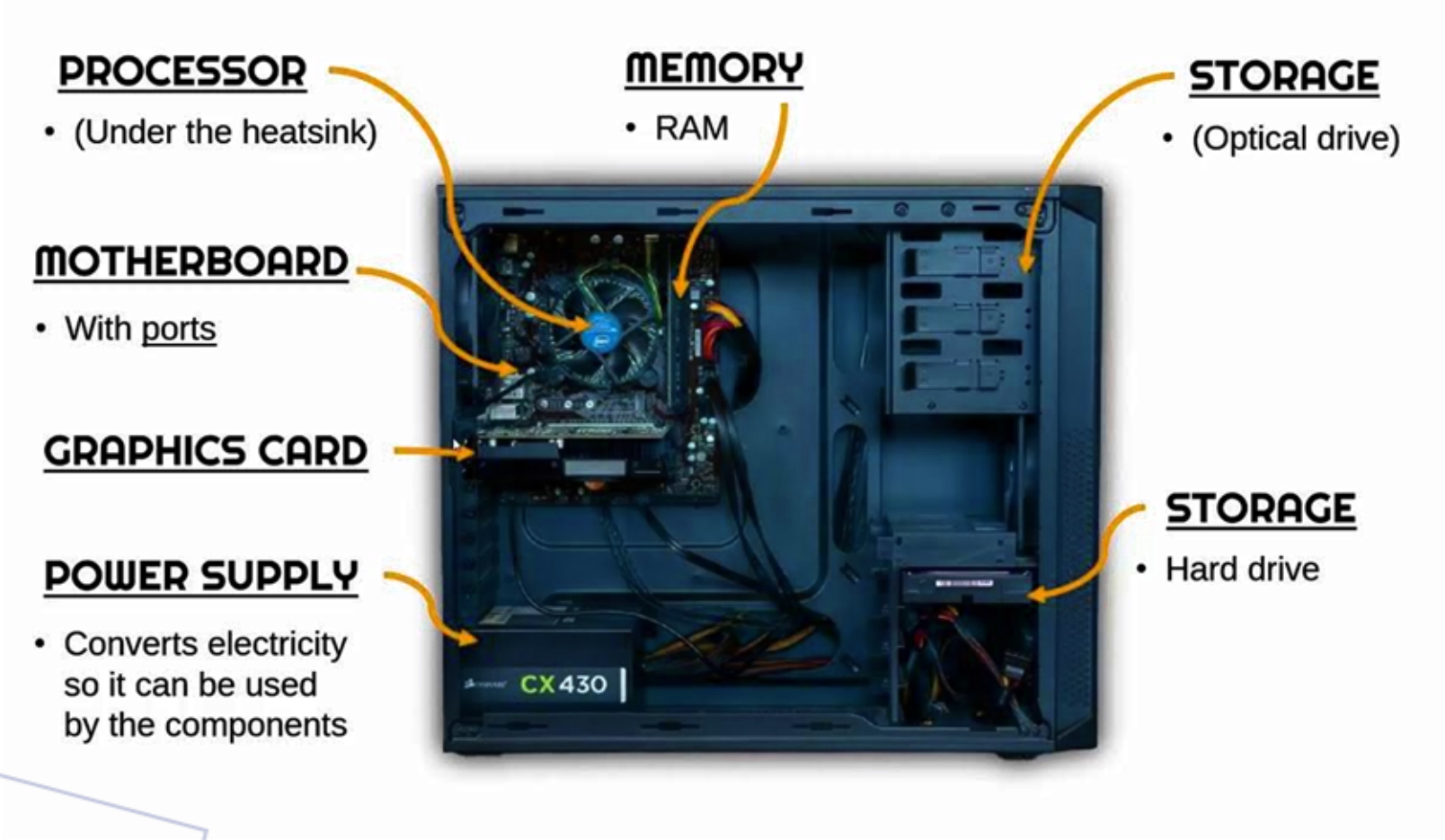
✅ Will prevent your hardware from being cooked in a power surge:

• RIP 💀:

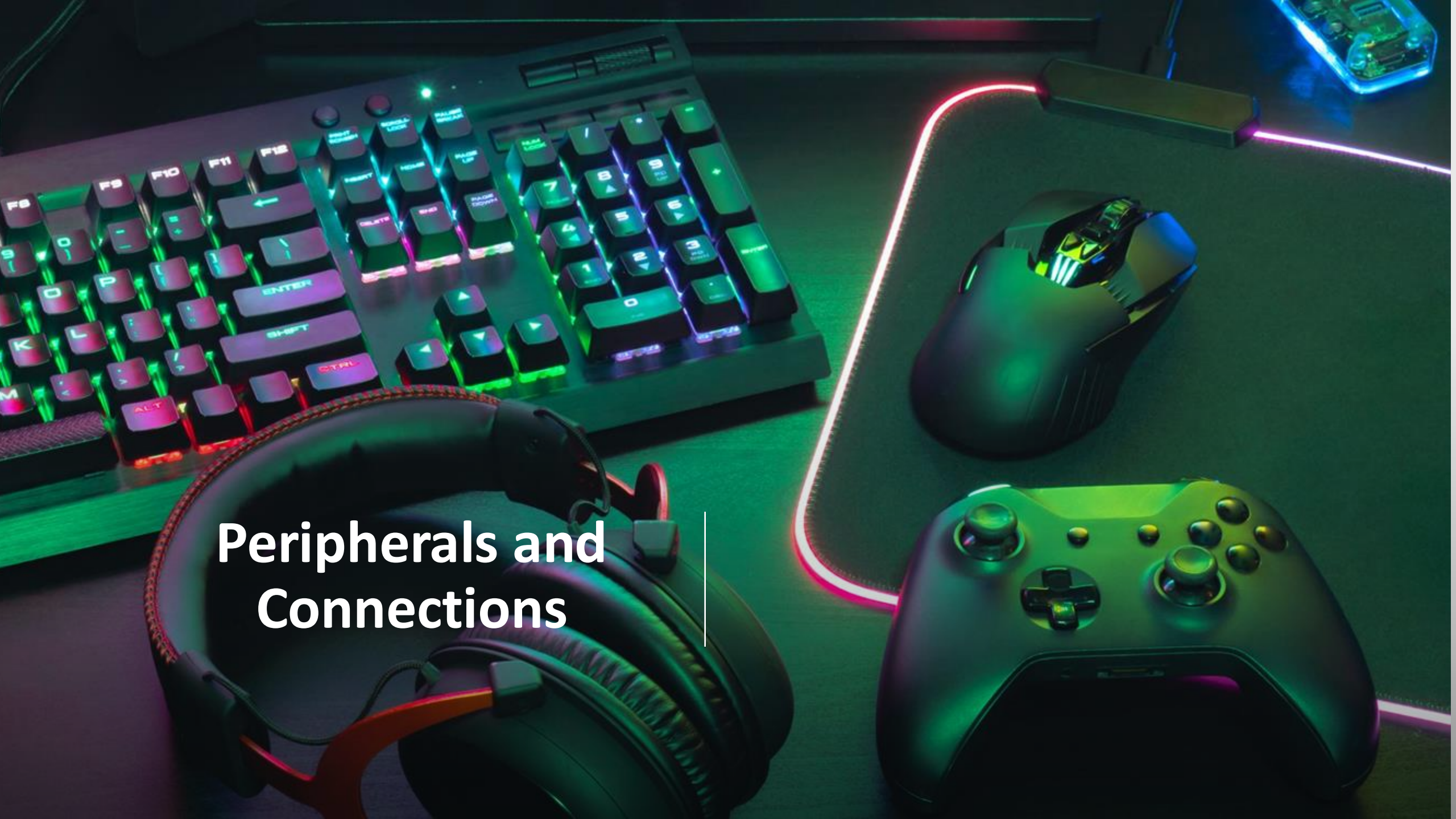
💯 *Hot Tip:*

You can also use an uninterruptable power supply (UPS) – basically a backup battery that can keep your computer powered for some time (e.g., 20 mins) if your power goes out.

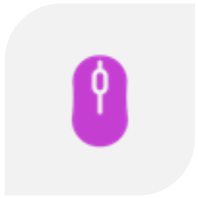
Putting it together



Above: Image from MrBrownCS. Key Internal Computer Parts. YouTube.


Peripherals and
Connections

KEYBOARD



MOUSE

CONTROLLER

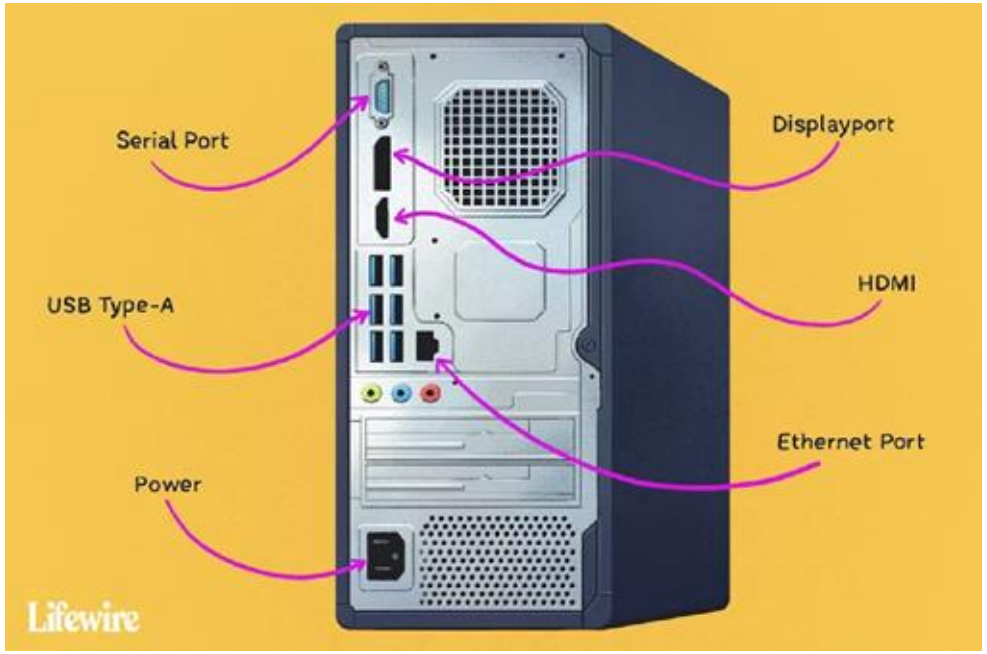
MONITOR

HEADPHONES

FLASH DRIVE

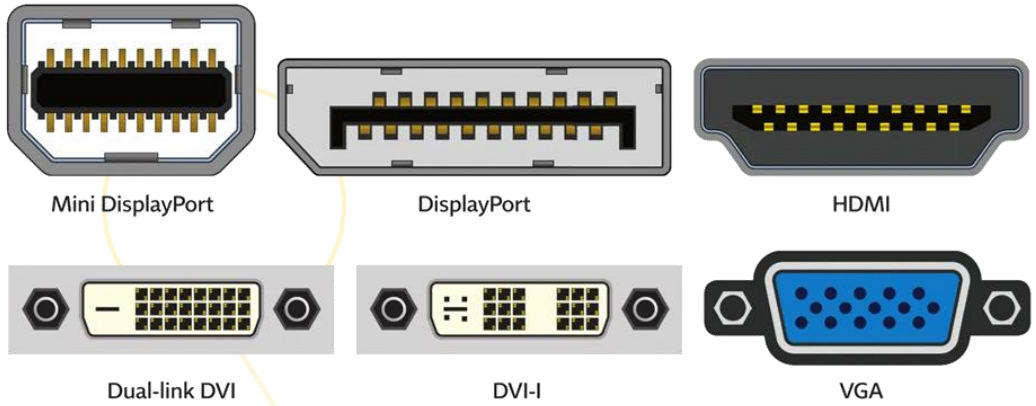
What is a peripheral device?

Ports on a computer: Desktop vs. Laptop



Enterprise desktops tend to include DisplayPort ports for several reasons (locking, support multiple monitors, higher bandwidth than HDMI ➔ better resolutions & refresh rates).

- Although the laptop above features an Ethernet (RJ-45) port, it is hard to find a laptop in 2025 that still has one! For one, it makes your laptop's form factor thicker. (You can buy USB adapters though!)
- Consider what ports you might need for all your peripherals before you purchase!



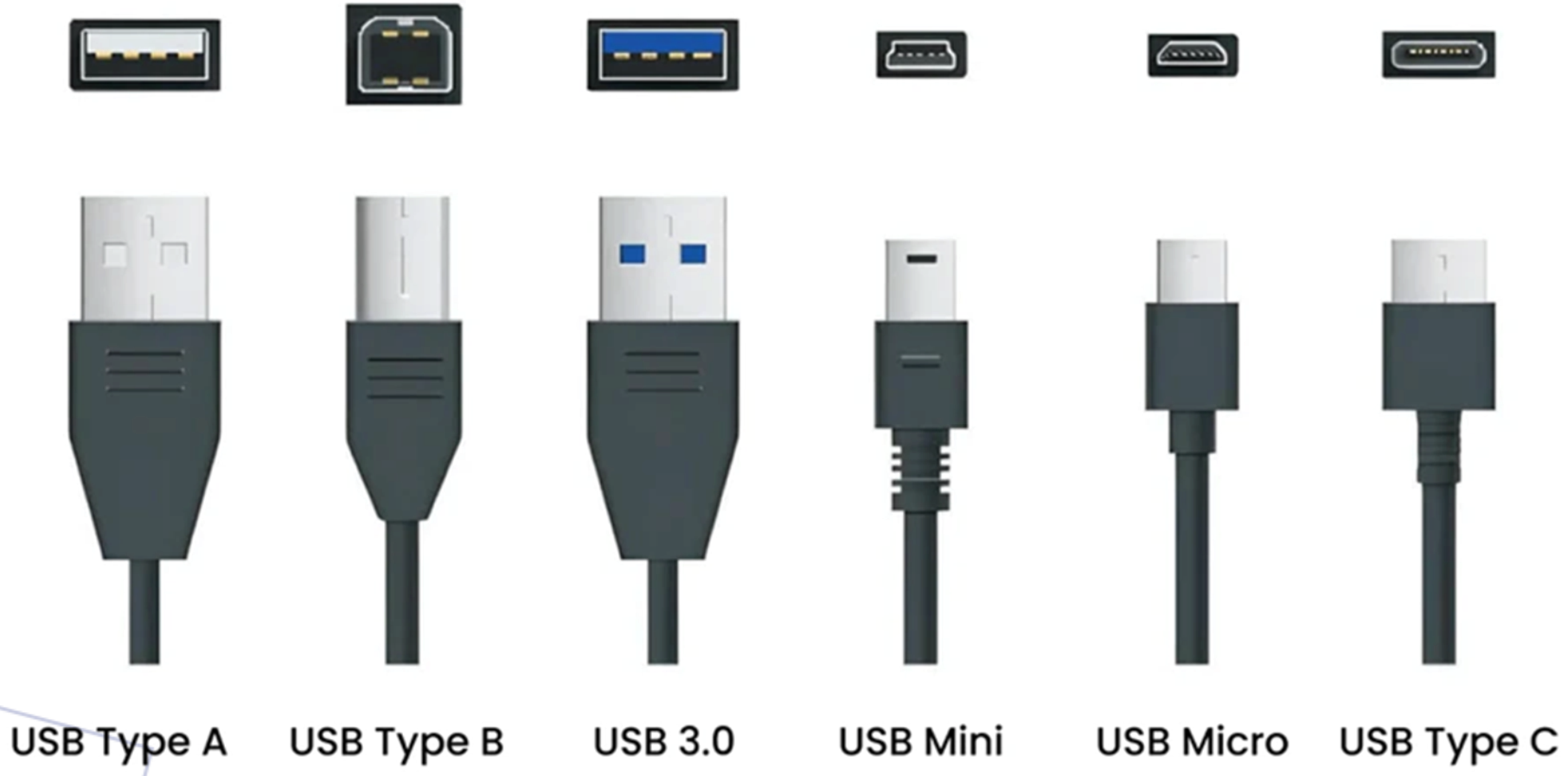
Display Connector Cables

- HDMI – Most commonly used for monitors and TVs.
- DisplayPort – Used in professional settings and for gaming monitors. Superior to HDMI!
- VGA and DVI – older screw-in cables found on CRT monitors and some older LED and LCD monitors.

Audio

- Most audio is processed “on-board” – either by the motherboard or the GPU.
- Sound Cards, like GPUs, do exist – mostly used in studio settings.
- USB connections, HDMI and DisplayPort also serve as an audio connection, along with the “Headphone Jack” TRS connector of various sizes.

USB Connector Cables (Power and/or data)



Honorable Mention:

Lightning Cable

Ethernet Cable (RJ-45)

- Primarily used for computer networking
- Allows multiple computers to communicate

Discussion: What should I buy?

In the following scenarios, think about your needs for processing power, multitasking, storage space, and portability:

- Basic Tasks (Homework, Netflix, Chatting)
- Gaming (Console v.s. Mobile v.s. PC – what fits your needs? Why?)
- Professional Use (Studio Recording, Video Editing, Art)