



Core Components

Central Processing Unit (CPU)

The brain of the computer, responsible for executing instructions. Key factors include clock speed (GHz), number of cores, and cache size.
Cores: Independent processing units within a single CPU.
Clock Speed: The rate at which a CPU executes instructions (measured in GHz).
Cache: Small, fast memory used to store frequently accessed data.
Examples: <ul style="list-style-type: none"> • Intel Core i7-13700K • AMD Ryzen 9 7950X

Random Access Memory (RAM)

Volatile memory used for storing data and instructions that the CPU is actively using. Measured in GB. More RAM improves multitasking and performance.
DDR5, DDR4: Types of RAM. DDR5 is the newer, faster standard.
Latency: Measured in CAS Latency (CL). Lower latency means faster performance.
Examples: <ul style="list-style-type: none"> • 16GB DDR5 5200MHz • 32GB DDR4 3200MHz

Storage Devices

Solid State Drive (SSD)	Faster, more durable storage using flash memory. Used for OS, applications, and frequently accessed files.
Hard Disk Drive (HDD)	Traditional mechanical storage. Slower, but cheaper for large capacities. Used for storing large files and backups.
NVMe: SSD interface for faster data transfer.	
SATA: Common interface for HDDs and older SSDs.	

Motherboard and Peripherals

Motherboard

The central circuit board that connects all components. Key factors include chipset, socket type (for CPU), RAM slots, and expansion slots.
Chipset: Determines compatibility with CPUs and other components.
Socket: Connector for the CPU.
Expansion Slots: Slots for adding expansion cards (e.g., GPUs, sound cards).
Examples: <ul style="list-style-type: none"> • ATX • Micro-ATX • Mini-ITX

Graphics Processing Unit (GPU)

Handles graphics rendering. Can be integrated (on the CPU) or discrete (separate card). Important for gaming, video editing, and other graphics-intensive tasks.
VRAM: Video RAM, dedicated memory for the GPU.
CUDA Cores/Stream Processors: Processing units within the GPU.
Examples: <ul style="list-style-type: none"> • NVIDIA GeForce RTX 4080 • AMD Radeon RX 7900 XTX

Peripherals

Input Devices	Keyboard, mouse, microphone, webcam, etc. Used for providing input to the computer.
Output Devices	Monitor, printer, speakers, headphones, etc. Used for receiving output from the computer.
Connectivity	USB, HDMI, DisplayPort, Ethernet, Wi-Fi, Bluetooth. Used for connecting peripherals and networking.

Power and Cooling

Power Supply Unit (PSU)

Supplies power to all components. Wattage rating must be sufficient for all components. Look for 80+ certification for efficiency.
80+ Certification: Indicates the PSU's energy efficiency (Bronze, Silver, Gold, Platinum, Titanium).
Wattage: The maximum power the PSU can deliver.
Examples: <ul style="list-style-type: none"> • 650W 80+ Gold • 850W 80+ Platinum

Cooling Solutions

Keeps components from overheating. Options include air coolers, liquid coolers (AIOs), and custom liquid cooling loops.
Air Cooler: Uses a heatsink and fan to dissipate heat.
Liquid Cooler: Uses a water block, pump, and radiator to dissipate heat more effectively.
Examples: <ul style="list-style-type: none"> • Noctua NH-D15 (Air Cooler) • Corsair iCUE H150i Elite LCD (Liquid Cooler)

Case

Form Factor	ATX, Micro-ATX, Mini-ITX. Determines the size and compatibility with motherboards.
Airflow	Good airflow is crucial for keeping components cool. Cases often have multiple fan mounts.
Cable Management	A well-designed case will offer features for managing cables to improve airflow and aesthetics.

Connectivity and Expansion

Expansion Slots

PCIe (Peripheral Component Interconnect Express) slots are used for adding expansion cards, such as graphics cards, sound cards, network cards, and storage controllers.
PCIe x16: Typically used for graphics cards. PCIe x4/x1: Used for other expansion cards.
The number and type of PCIe slots available on a motherboard can significantly impact its expandability and suitability for different workloads.

Ports and Connectors

USB (Universal Serial Bus)	Used for connecting peripherals such as keyboards, mice, storage devices, and other accessories. USB 3.2 and USB4 offer faster data transfer speeds.
HDMI (High-Definition Multimedia Interface)	Used for connecting displays, such as monitors and TVs. Carries both video and audio signals.
DisplayPort	An alternative to HDMI, also used for connecting displays. Often preferred for high refresh rate gaming monitors.
Ethernet (RJ45)	Used for wired network connections. Provides a stable and reliable internet connection.