How to Build a Gaming PC

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Choose compatible parts, assemble them safely and get a gaming PC running at the performance you paid for — from parts list to first benchmark.

Things you will need

- CPU (Intel Core or AMD Ryzen)
- Motherboard with matching socket
- Graphics card (GPU) — dedicated for gaming
- RAM (16GB minimum, 32GB recommended)
- Storage drive (512GB SSD minimum)
- Power supply unit (650W minimum, 80+ Gold rated)
- PC case with included fans
- CPU cooler (air or AIO liquid)
- Thermal paste (Arctic MX-4 or similar)
- Phillips #2 screwdriver
- Anti-static wristband
- Cable ties or Velcro straps
- Bootable OS USB drive (Windows 11 or Linux)
- Monitor, keyboard, and mouse
- Small parts organizer for screws

Planning Your Build

1. **Define Your Build Goals**
   Start by clarifying what you want your PC to do.
2. **Choose Your CPU**
   The CPU is the brain of your PC.
3. **Select Your Motherboard**
   The motherboard ties every component together.
4. **Pick Your Graphics Card**
   The GPU is the most important component for gaming.
5. **Set Your Budget and Buy Components**
   Set a realistic budget before shopping.

Preparing Components and Workspace

6. **Prepare Your Workspace**
   Set up a large, clean, well-lit table with enough space to lay out components.
7. **Gather Tools and Supplies**
   You will need a Phillips #2 screwdriver, an anti-static wristband, thermal paste, cable ties, and a small parts organizer.
8. **Unbox Components Carefully**

Unbox each component on the workspace before installation.

9. **Install Memory (RAM)**

   Install RAM before the motherboard goes into the case — it is easier and safer.

10. **Install the CPU**

    Handle the CPU only by its edges to avoid touching the delicate pins or contacts.

11. **Apply CPU Cooler**

    Apply a pea-sized drop of thermal paste directly onto the center of the CPU, then mount your cooler evenly and tighten screws in a diagonal pattern for even pressure.

Installing Core Components

12. **Install the Motherboard in the Case**

    Place the motherboard standoffs in the case, then lower the motherboard onto them.

13. **Install the Graphics Card**

    Remove the PCIe slot covers opposite your M.2 slot to make room for the GPU.

14. **Install Storage Drives**

    Install your SSD in an M.2 slot on the motherboard if available — slide it in at a 30-degree angle and press down until it clicks, then tighten the standoff screw.

15. **Install Power Supply**

    Slide the power supply into the case's PSU bay — most modern cases have bottom-mounted PSU locations.

16. **Connect Motherboard Power**

    Connect the 24-pin ATX power cable to the motherboard's right-side connector, then the 8-pin CPU power cable to the left-top connector.

17. **Manage Cables**

    Route all cables behind the motherboard tray through the cable management holes.

Connecting Peripherals and Power

18. **Connect Network and Audio**

    Plug in your Ethernet cable for a stable wired connection, or connect a Wi-Fi adapter if your motherboard lacks built-in Wi-Fi.

19. **Connect the Monitor and Peripherals**

    Connect your monitor to the GPU's display port — never the motherboard's ports if you have a dedicated GPU.

20. **Install Operating System**

    Create a bootable USB drive with your operating system — Windows 11 or Ubuntu Linux.

21. **Install Drivers and Software**

    Install chipset drivers from your motherboard manufacturer's website first, then GPU drivers from NVIDIA or AMD.

22. **Configure BIOS Settings**

    Enter the BIOS by pressing the Del or F2 key during POST.

Testing and Optimizing Your PC

23. Run Stress Tests

Stress test your components individually to verify stability.

24. Monitor Temperatures

Use MSI Afterburner or HWMonitor to track CPU and GPU temperatures during gaming and stress tests.

25. Benchmark Performance

Run 3DMark and Geekbench to measure graphics and overall system performance.

26. Optimize Fan Curves

Configure fan curves in your BIOS or motherboard software for quiet, efficient cooling.

27. Add RGB Lighting

If your components have RGB lighting, connect the RGB headers to your motherboard and control them with software like MSI Mystic Light or ASUS Armoury Crate.

28. Final Checks and Maintenance

Do a final check of all connections — reseat any cables that may have loosened during testing.

Sources

1. PCPartPicker Compatibility Database
   https://pcpartpicker.com/
2. Intel Processor Specifications
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   https://www.amd.com/en/products/processors/desktops/ryzen.html
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   https://www.nvidia.com/Download/index.aspx
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6. 80 PLUS Power Supply Certification
   https://www.clearesult.com/80plus/
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Written as a checklist from https://www.howcompass.com/how-to/Build-a-Gaming-PC. Corrections: https://www.howcompass.com/corrections