Form Factors

- Motherboards and cases follow standardized form factors
- Common form factors: ATX, microATX, Mini-ITX
- Power supplies offer standardized connectors

Form Factors - I/O areas on a Motherboard for a system case where everything aligns
It's a Standardization!

ATX (Advanced Technology eXtended)
ITX (Information Technology eXtended)

ATX Form Factor - 12" x 9.6" (Very Standard Size)
Micro-ATX Form Factor - 9.6" x 9.6"
Mini-ITX Form Factor - 6.75" x 6.75" (Home Theater Boxes; Point of Sales)
ITX Form Factor - Larger Version of the Mini-ITX (not shown above & not common)

All of these Form Factors can be powered with a ATX Power Supply,
because these form factors are standardized!!

Every Motherboard comes with its own I/O Shield
When the Motherboard (Mobo) is installed in the system case,
there will always be a tight fit, because of this standardization,
no matter what Form Factor we're dealing with!

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Chipsets

- Chipsets combine functions from many single-function chips
- Early chipsets offered Northbridge and Southbridge
- Modem Chipsets feature Southbridge (CPU handles Northbridge functions)
- Chipsets define RAM capacity, USB capabilities, and much more

During the earlier years of the PC world, the Mobo had a LOT of single function chips.
It evolved into single chips doing multiple jobs, known as Chip Sets

2 Chip Sets - Northbridge & Southbridge are designed to work together (need both)

Northbridge - Acted as the interface to the CPU (does all the fast stuff)
Memory Controller; High Speed Expansion Buses; etc
(interface: a point where 2 systems meet & interact)

Southbridge - Interconnection to the slower stuff
Individual Ports (USB); etc

The functions of these 2 Chip Sets has changed over the years

Todays CPU's take over all of the Northbridge Functions.
Todays Chip Sets are really just a Southbridge (just a single chip)

The Chip Set determines what a system is actually capable of.
# of sticks of RAM; # of Video Cards; Max Speed of RAM; # USB ports; etc
When buying a Mobo, you're really buying a Chip Set!

Intel Core i7-8086k

Chipset	Max PCI Express Lanes	PCI Support?	USB 3.1 Gen 2	USB 3.1 Gen 1	USB 2.0	SATA Ports	Thermal Design Power
Intel B360	12	Yes	4 ports	6 ports	Up to 12 ports	6	6 Watts
HM370	16	No	4 ports	8 ports	Up to 14 ports	4	3 Watts
Q370	24	No	6 ports	10 ports	Up to 14 ports	6	6 Watts
Z370	24	No	6 ports	10 ports	Up to 14 ports	6	6 Watts

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Choosing the Right Motherboard

- Motherboard is the backbone of a PC and all other components interface with it
- Type of CPU, form factor, and extra RAM capacity
are all important considerations when choosing a new motherboard
- When selecting a motherboard, consider its intended use
- Motherboards may be referred to as mainboards, system boards,
backplane boards, or mobos

Is it for a desktop or laptop?
Does it need to be multi socket like for a server?

pcpartpicker.com

Name	Socket / CPU	Form Factor	Memory Max	Memory Slots
Gigabyte B660M DS3H DDR4	LGA1700	Micro ATX	128 GB	4
Asus ROG STRIX Z690-A GAMING WIFI D4	LGA1700	ATX	128 GB	4
MSI MAG Z690 TOMAHAWK WIFI DDR4	LGA1700	ATX	128 GB	4
MSI MAG B660M MORTAR WIFI DDR4	LGA1700	Micro ATX	128 GB	4
Asus PRIME Z690-P WIFI D4	LGA1700	ATX	128 GB	4

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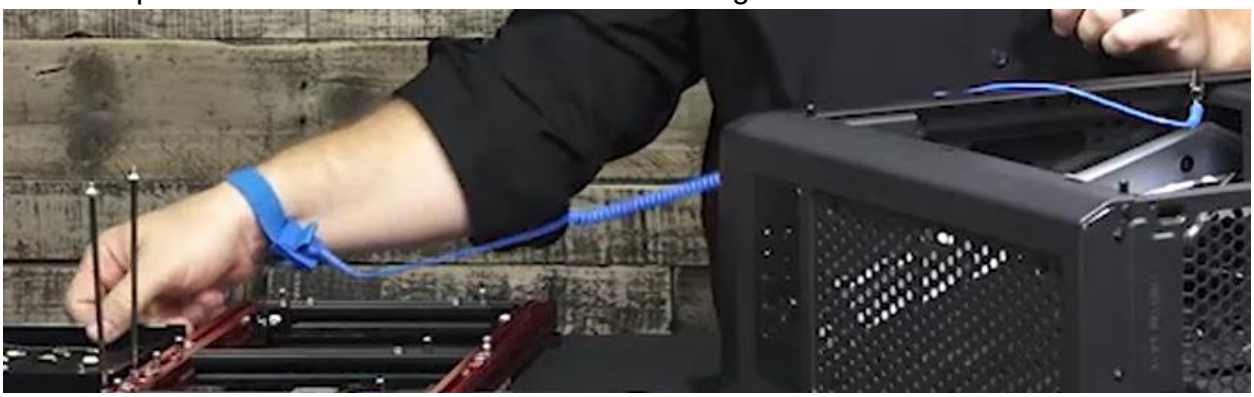
Installing and Troubleshooting a Motherboard

- Standoff screws reduce the risk of electrical damage to the mobo
- I/O shields are custom-made for the motherboard
- Installing the CPU and heat sink prior to installing the motherboard makes the build process much easier

ESD Strap - Grounds/reduces the electrostatic charge



Standoff Screws - give clearance above the case so the motherboard doesn't ever contact the metal case, which could result in a short, and they provide a stable mount for placing the mobo

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I/O Shield - blocks dust from coming into the case

Open-air frame/case

The main purpose of a Capacitor is to hold a charge.
Good capacitors have flat tops.

Capacitor Swelling - bad capacitors dome up on the top

Remove the power source! You've got a defective motherboard!

Be aware of any Burning Smells!

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I’d really appreciate it if you were to rate & review this course.

Thank you and keep up the good work!
Robert Mathisen

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