Chapter 4

RAM

Episode 4.01

Episode title: **RAM Technology**

Objective: N/A

DDR Speed

Clock Speed	DDR Speed Rating	PC Speed Rating
100 MHz	DDR-200	PC-1600
133 MHz	DDR-266	PC-2100
166 MHz	DDR-333	PC-2700
200 MHz	DDR-400	PC-3200
217 MHz	DDR-433	PC-3500
233 MHz	DDR-466	PC-3700
250 MHz	DDR-500	PC-4000
275 MHz	DDR-550	PC-4400
300 MHz	DDR-600	PC-4800

DDR2 Speed

Core RAM Clock Speed	DDR I/O Speed	DDR2 Speed Rating	PC Speed Rating
100 MHz	200 MHz	DDR2-400	PC2-3200
133 MHz	266 MHz	DDR2-533	PC2-4200
166 MHz	333 MHz	DDR2-667	PC2-5300
200 MHz	400 MHz	DDR2-800	PC2-6400
266 MHz	533 MHz	DDR2-1066	PC2-8500
	x2	x4	x8

DDR3 Speed

Core RAM Clock Speed	DDR I/O Speed	DDR3 Speed Rating	PC Speed Rating
100 MHz	400 MHz	DDR3-800	PC3-6400
133 MHz	533 MHz	DDR3-1066	PC3-8500
166 MHz	667 MHz	DDR3-1333	PC3-10667
200 MHz	800 MHz	DDR3-1600	PC3-12800
233 MHz	933 MHz	DDR3-1866	PC3-14900
266 MHz	1066 MHz	DDR3-2133	PC3-17000
300 MHz	1200 MHz	DDR3-2400	PC3-19200
	X4	x2	x8

DDR4 Speed

Clock Speed	Bandwidth	DDR3 Speed Rating	PC Speed Rating
200 MHz	1600 MT/s	DDR4-1600	PC4-12800
266 MHz	2133 MT/s	DDR4-2133	PC4-17000
300 MHz	2400 MT/s	DDR4-2400	PC4-19200
400 MHz	3200 MT/s	DDR4-3200	PC4-25600

Episode 4.02

Episode title: **RAM Capacity**

Objective: N/A

Episode 4.03

Episode title: **RAM Features**

Objective: N/A

Episode 4.04

Episode title: **Virtual Memory**

Objective: N/A

Episode 4.05

Episode title: **Installing and Troubleshooting RAM**

Objective:

- Review your hardware and software technical requirements before choosing RAM
- RAM sticks have generation-specific notches that line up with the appropriate slot on a motherboard
- Poorly seated RAM is often the main cause of non-functional RAM

Lower 3rds

OBJ – Random access memory (RAM)

8GB is the minimum required

identify the RAM compatible with your PC

form, fit, and function (3-Fs)

Double Data Rate Synchronous Dynamic Random-Access Memory, 4th generation (DDR4)

Small Outline Dual In-line Memory Module (SODIMM)

Process to replace or install a SODIMM memory module:

Lower 3rds

1: Gather the tools needed.

2: Power off + remove all power sources.

discharge any residual electrical power.

3: Open the case for memory slots

Common locations: under keyboard/access pannel

Lower 3rds

4: Remove the memory

Hand only, remove module

5: Install new module.

Don’t touch the metal contacts on the bottom edge of the card

Lower 3rds

6: Test

Test installation before you replace case covers

7: Troubleshooting

Problem with: RAM, modules, installation

8: Close up system

Step 1: Gather the tools needed

- memory module
- non-ESD surface
- ESD wrist strap
- non-magnetic-tip screwdriver
- technical manual for the PC

STEP 2: Power off and remove all power sources

- Power off the PC
- Remove its power cord
- Open up the case and remove the battery

Press the power button and hold it for 30 seconds to discharge any residual electrical power

STEP 3: Open the case to expose the memory slots

There is no standard for where the memory slots are in the PC

Look to PC's documentation or on the manufacturer's website

Most common location for the memory modules:

- Under the keyboard
- Under access panel on the PC's bottom

Step 4: Remove the memory being replaced

To remove existing memory module:

- Press the retaining clips on either side of the module down to unlock it
- Using your hand only, remove the module from the slot

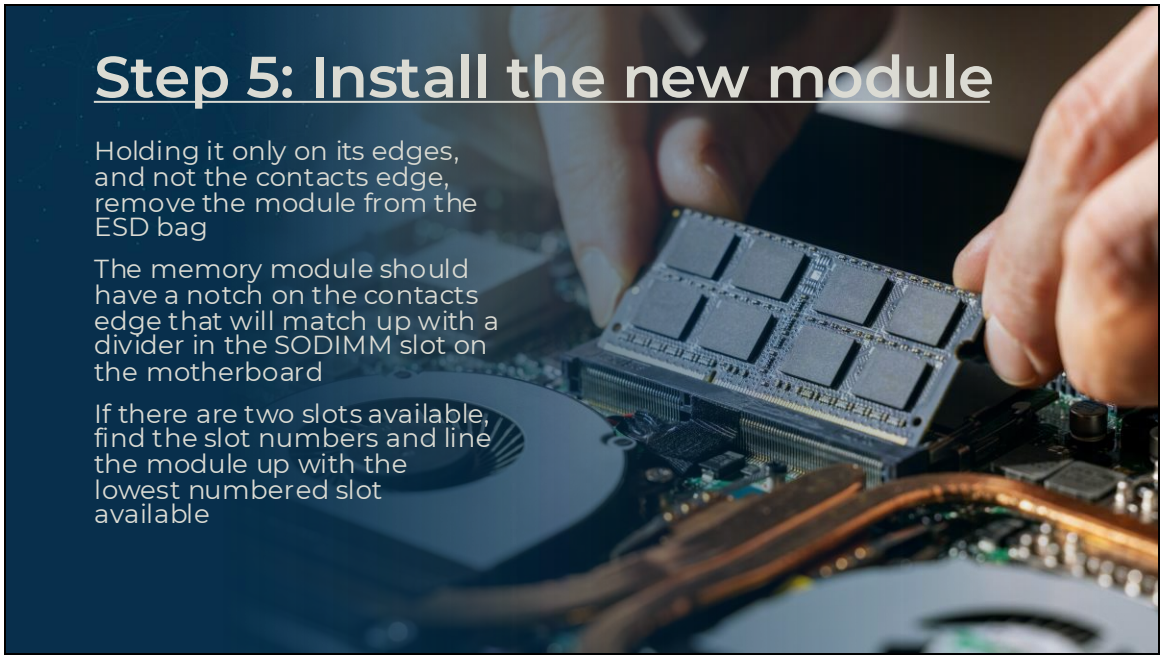
Don't use a screwdriver, pry tool, crowbar, or any other tool to loosen, remove, or install the module

Step 5: Install the new module

Holding it only on its edges, and not the contacts edge, remove the module from the ESD bag

The memory module should have a notch on the contacts edge that will match up with a divider in the SODIMM slot on the motherboard

If there are two slots available, find the slot numbers and line the module up with the lowest numbered slot available



Install the new module

- Press the top of the module down to lay flat against the motherboard
- You should hear or feel a snap when it locks into place

Step 6: Test

You should test the installation before you replace the case covers

Reconnect the PC to a power source by replacing the battery or reconnecting it to an electrical outlet

Testing

If the computer powers up,
the amount of memory may show
up on the startup screen

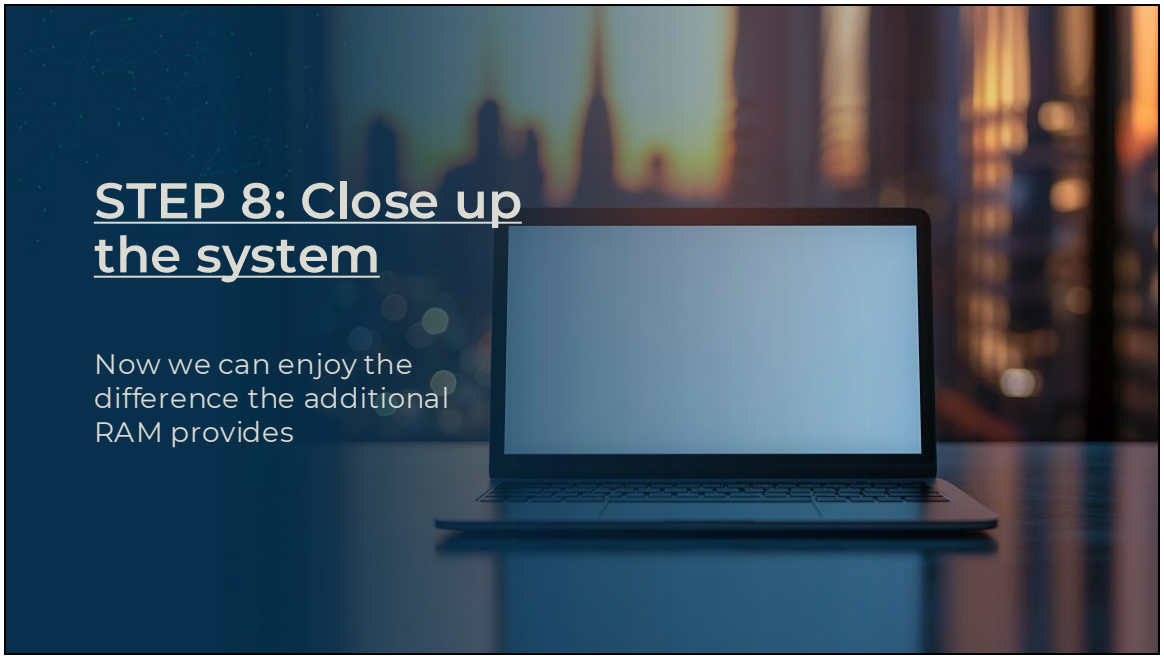
STEP 7: Troubleshooting

If the PC will not power up - check the battery installation or check the AC connections

If PC powers up, but nothing else happens - shut the PC down and go back to Step 5 and check the fit or the security of the module in the slot

If internal devices or component is failing - Check the cable connectors to ensure they have a snug fit

If all else fails - could just be that the RAM module has a problem that came with it or we caused


STEP 8: Close up the system
Now we can enjoy the difference the additional RAM provides