

Learner Full Name: _____ School: _____
Assigned Workstation: _____ Class: _____

Session 6: Inside the Computer: Processor, Memory & Storage

In Session 1 you met the outside of a computer: the monitor, keyboard, mouse and system unit. Today we open the box (in our imagination and in the 3D lab, **never** with a screwdriver!) and meet the three parts that do the real work. By the end you will know why some computers are fast, why some are slow, and why a power cut can eat your work.

1. Plain Talk: The Chop Bar Kitchen

Picture the kitchen behind a busy chop bar. Orders keep coming in: "One fufu and light soup! Two waakye!" Three things make the kitchen work:

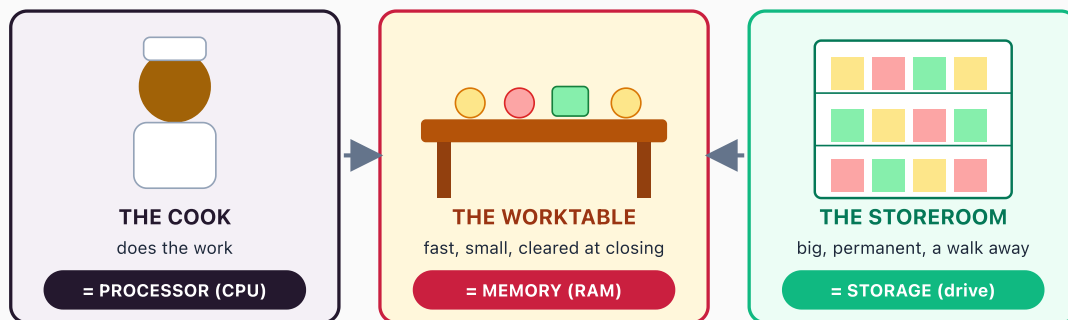


Figure 6.0: The chop bar kitchen. The cook works only on what is on the worktable; ingredients are fetched from the storeroom.

Part	What it does	You might see it written as...
Processor (CPU)	The "brain" that follows instructions and does every calculation, billions per second.	Intel Core i5, AMD Ryzen 5, Intel Celeron
Memory (RAM)	Holds the programmes and files you are using <i>right now</i> .	4 GB, 8 GB or 16 GB RAM
Storage	Keeps your files, photos and programmes, even when the power is off.	256 GB SSD, 1 TB hard drive

💡 THE SMALL-TABLE PROBLEM

If the worktable is tiny, the cook keeps putting things back and walking to the storeroom for more. The food comes out slowly, even with a fast cook! A computer with too little RAM does the same: it keeps swapping things to the storage drive, and everything feels slow.

1. Two Kinds of "Space" in a Computer

People often mix these two up, because both are measured in GB. They are very different jobs.

MEMORY (RAM) = the worktable

- Very **fast**, but **small** (usually 4 to 16 GB).
- Holds only what you are working on **now**: open programmes, open files, open browser tabs.
- **Temporary**: it is wiped clean when the computer shuts down or the power goes off.

STORAGE = the storeroom

- Much **bigger** (often 256 GB to 1 TB or more), but slower to reach.
- Keeps **everything**: Windows, your programmes, saved documents, photos, music.
- **Permanent**: files stay there when the power is off, until you delete them.

2. What Happens When You Open, Work and Save

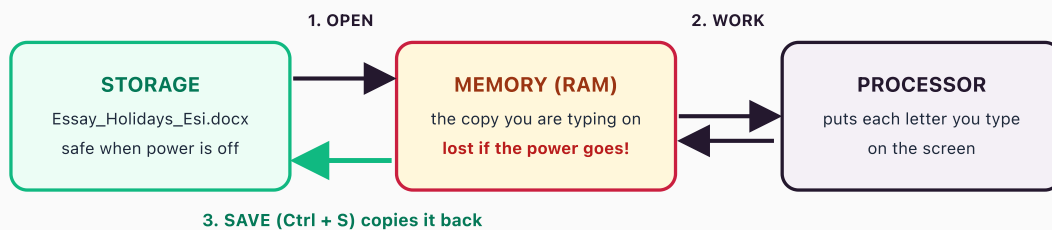


Figure 6.1: Opening copies a file from storage onto the worktable (RAM). Only saving copies your changes back to the storeroom.

WHY DUMSOR EATS UNSAVED WORK

When the lights go off, a desktop PC switches off at once and the worktable (RAM) is wiped. Every sentence you typed since your last save was **only on the worktable**, so it is gone. Whatever you saved is safe in the storeroom. This is why Session 4 taught you the habit: press **Ctrl** + **S** every 5 minutes!

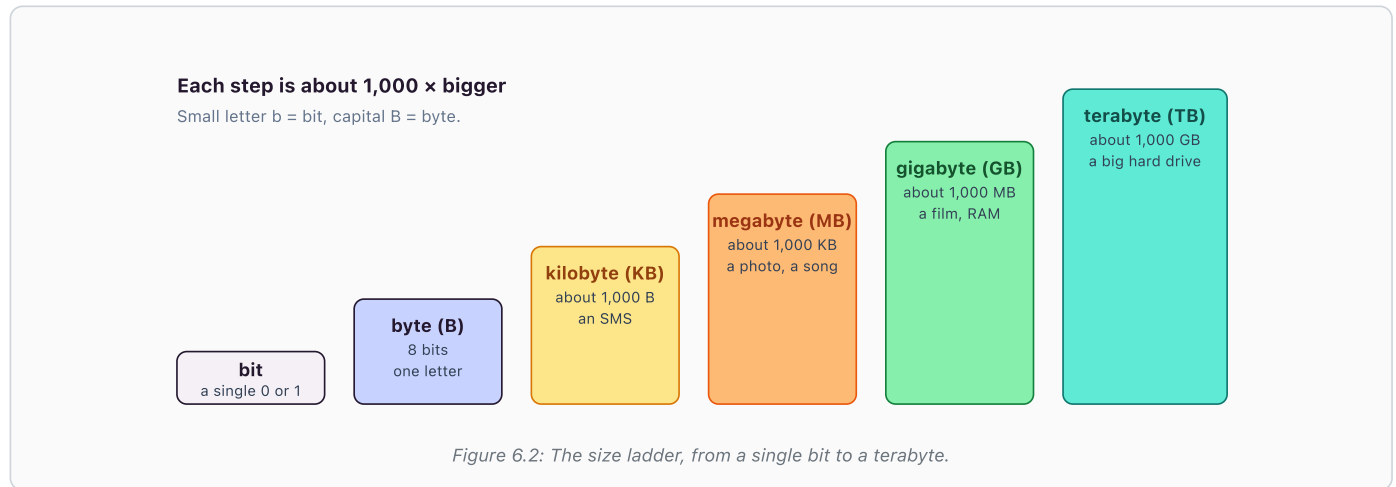
3. Your Turn

a) Esi typed for 20 minutes and never saved. Kofi saved every 5 minutes. The power went off. Who lost more work, and why?

b) Yaw's laptop has 4 GB of RAM and a 1 TB drive. His friend says "1 TB is huge, so your laptop must be very fast!" Is the friend right? Explain using the kitchen.

1. Bits and Bytes

Deep down, a computer stores everything as tiny on/off switches. Each one is a **bit** (it is either 0 or 1). Eight bits make one **byte**, which is enough to store one letter, such as **A**. From there, each step up the ladder is about **1,000 times** bigger (exactly 1,024 inside the computer, but 1,000 is close enough for us).



2. How Big Are Everyday Files? (Approximate)

Thing	About how big? (sizes vary)
One SMS text message	Under 1 KB
A one-page typed letter (.docx)	About 20 to 50 KB
A photo taken on a phone	About 3 to 5 MB
A song (MP3)	About 4 MB
One hour of HD video	About 1 to 3 GB
Windows 11 itself	Tens of GB of storage

3. Your Turn: Quick Sums

Use **1 GB = 1,000 MB** to keep the sums easy.

Question	Answer
1. How many 4 MB songs fit in 1 GB?	-----
2. Naa's phone has 2 GB free. About how many 4 MB photos can she still take?	-----
3. Which is bigger: 500 MB or 1 GB?	-----
4. Put in order, smallest first: GB, KB, TB, MB	-----

MOBILE DATA USES THE SAME LADDER

When someone buys a "2 GB data bundle", that is the same gigabyte. Watching one hour of HD video could use up most of it!

1. Where Can Files Live?

Storage	What it is	Speed	Cost per GB
Hard drive (HDD)	Spinning metal discs inside older and cheaper PCs. Big, but can break if knocked.	Slow	Cheap
SSD (solid-state drive)	Memory chips, no moving parts. Inside most new laptops.	Very fast	Medium
USB pen drive	Small and portable (Session 5). Easy to lose!	Medium	Medium
Memory card (microSD)	Tiny card for phones and cameras.	Medium	Medium
Phone storage	Built-in storage, for example "64 GB".	Fast	Costly
Cloud	Storage on someone else's computers, reached over the internet (Google Drive, OneDrive).	Needs internet	Free to start

THE TWO-PLACES RULE (BACKUPS)

Any important file should live in **at least two places**, for example on the PC *and* on a pen drive or in the cloud. A copy kept in case the first one is lost is called a **backup**. Drives break, phones get stolen, pen drives fall in the gutter. A backup means you shrug instead of cry.

2. File Types and Extensions

The letters after the dot in a file name are its **extension**. They tell Windows which programme opens the file.

.docx Word document
.xlsx Excel spreadsheet

.pptx PowerPoint slides
.pdf PDF (looks the same everywhere)

.jpg photo or picture
.mp4 video
.zip packed folder

Show extensions in File Explorer: Windows 11: **View** → **Show** → **File name extensions**. Windows 10: **View** tab → tick **File name extensions**. When you rename a file, never change or delete the extension, or the file may not open.

3. ZIP Files: A Packed Bag

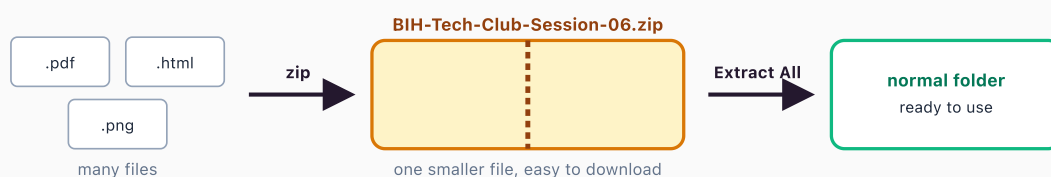


Figure 6.3: A ZIP file packs many files into one smaller file. "Extract All" unpacks it into a normal folder.

The club's study packs are ZIP files. To unpack one: **right-click the .zip file** → **Extract All...** → **Extract**. A new normal folder appears next to it. Always extract first, then open the files from the new folder.

1. Warm-Up: Inside the Box

Open the **Inside the Box** 3D lab on your session page. Open the case, lift out the processor, memory and storage and read what each one does. Then run the chop bar kitchen with a small worktable and a big one, and write what changed:

2. Lab Mission: Find Your Computer's Parts

Every computer can tell you what is inside it. You will be a detective and write a **spec sheet** (a list of the specifications, or main facts, about a machine).

- 1 Open About:** Click **Start** → **Settings** (the gear) → **System** → scroll down and click **About**. (Shortcut: **Windows** + **Pause** on some keyboards.) It may look slightly different on Windows 10.
- 2 Read the Device specifications:** find the **Device name**, **Processor** and **Installed RAM**. Copy them into the table below. Under **Windows specifications**, find the **Edition** (for example Windows 11 Home).
- 3 Check the storage:** press **Windows** + **E** to open File Explorer, then click **This PC**. Under the **Local Disk (C:)** bar you will see something like "120 GB free of 237 GB". A bar that turns **red** means the drive is nearly full.
- 4 Do the sum:** a class photo is about **4 MB**. How many class photos fit in the free space? (Free GB × 1,000 ÷ 4.)

Spec sheet for my PC	What I found
Device name	-----
Processor (the cook)	-----
Installed RAM (the worktable)	-----
Windows edition	-----
Drive C: total size (the storeroom)	-----
Drive C: free space	-----
Class photos that fit (4 MB each)	-----

Compare with a neighbour: whose PC has the bigger worktable (RAM)? Whose storeroom has more free space?

LOOK, DON'T CHANGE

Apart from showing file extensions, today you are only **reading** information. Don't click "Rename this PC", don't change anything, and never open a computer case. Inside there is mains electricity and parts that break easily.

1. "Why Is My Computer Slow?" Pick the Best Fix

Problem	Best fix (choose one)
1. Akosua has 25 browser tabs open, plus Word and a game. Everything is crawling.	☐ Buy a bigger hard drive ☐ Close the tabs and programmes she is not using ☐ Turn the screen brightness down
2. In This PC, Kwame's C: drive bar is red: "1.2 GB free of 237 GB". The PC is slow and will not install updates.	☐ Move old videos to a pen drive or the cloud and empty the Recycle Bin ☐ Open more programmes ☐ Unplug the mouse
3. The office PC is 10 years old, has an old hard drive and takes 5 minutes to start.	☐ Shout at it ☐ Ask a technician about replacing the hard drive with an SSD ☐ Save files more often

2. Written Review Questions

Question 1: What is the difference between memory (RAM) and storage? Use the chop bar kitchen in your answer.

Question 2: Selasi's science project is saved only on one pen drive. What could go wrong, and what should he do?

3. Self-Assessment & Mentor Sign-Off

Tick the column that reflects your confidence at the end of Session 6:

Inside-the-Computer Competency	With Help	Almost Alone	All By Myself!
1. I can explain what the processor, memory and storage do.	☐	☐	☐
2. I can put KB, MB, GB and TB in order and do simple size sums.	☐	☐	☐
3. I can find a PC's processor, RAM and free storage.	☐	☐	☐
4. I can show file extensions and extract a ZIP file.	☐	☐	☐

Mentor Signature: _____

Date Completed: _____