

Monitors, printers and storage

Printable handout — output you can see and output you can hold, the numbers that decide how fast a machine feels, and how much storage a set of files really needs.

This is the lesson the marked task leans on

By the end of it you should be able to read a laptop advert and say which numbers matter for a given person and which are there to fill the page. Four of these five objectives are what the *Buy a computer for R12 000* task needs.

Objectives

1. Compare monitors and projectors on the specifications that actually matter.
2. Choose between inkjet and laser for a stated purpose and justify the cost per page.
3. Distinguish softcopy from hardcopy output.
4. Compare HDD, SSD, flash and cloud storage on speed, cost, capacity and durability.
5. Order the capacity units and estimate the storage a given set of files needs.

1 · Getting results out

Device	What matters about it
Monitors	Size in inches, sharpness in resolution — 1920×1080 is standard.
Projectors	A monitor for a room. Brightness matters more than resolution in a lit classroom: a very sharp, very dim projector is useless at eleven in the morning.
Printers	Hardcopy. Inkjet for photos and colour; laser for volume and crisp text. The reason is cost per page — toner is expensive to buy and cheap per page, cartridges are the other way round.
Speakers	Audio output for media, alerts and accessibility tools such as screen readers.
Headsets	Private audio output, usually paired with a microphone, which is an input device.
Actuators	Output that moves something: a printer motor, a vibration, a robot arm. If the computer caused it to happen in the physical world, it is output.

Two terms you must know. *Softcopy* is output you can only see on a screen. *Hardcopy* is output you can hold. The same document is softcopy on your monitor and hardcopy once printed.

2 · The processor and its workbench

Number	What it tells you
GHz	Clock speed — how many billion basic operations the CPU handles each second.
Cores	Independent workers on one chip. Four cores genuinely handle four tasks at once.
GB of RAM	How much work can stay open at the same time.

	RAM — the desk surface	Storage — the drawers
Speed	Fast	Slower
Size	Small	Much larger
Survives power off?	No — volatile	Yes — permanent
What lives there	Everything you have open right now	Files, programs, the operating system

Two consequences. Cut the power and the desk is swept clean instantly — which is why unsaved work disappears. And if the desk is too small you spend all your time fetching from the drawers, which is exactly why a machine short of RAM crawls. Free disk space does not help: it does not make the desk any bigger.

3 · Where files actually live

Type	Speed, cost, durability
Hard drive (HDD)	Spinning magnetic disks. Cheap per gigabyte and large, but slower and easily damaged by a knock.
Solid-state (SSD)	No moving parts. Much faster and tougher, more expensive per gigabyte. Standard in new laptops.
Flash memory	USB sticks and memory cards. Portable and convenient — and the easiest thing in the world to lose.
Optical discs	CDs and DVDs. Nearly obsolete: low capacity, and few new machines have a drive.
Cloud storage	Files on someone else's servers, reachable anywhere — as long as you have a connection.
Backups	A second copy in a different place. Not optional: drives fail without warning.

This is why a cheap laptop with an SSD often feels faster than an expensive one with a hard drive: most of what makes a machine feel slow is waiting for the drive, not waiting for the processor.

4 · How much storage does that actually need?

Each unit is roughly a thousand times the one before: **KB** → **MB** → **GB** → **TB**. You cannot estimate anything without a few anchor figures, so memorise these four.

Item	Typical size
Page of text	≈ 50 KB
Photograph	≈ 4 MB
Song	≈ 5 MB
One hour of video	≈ 2 GB

The method has four steps:

1. **List and count** — how many of each kind of file. “Lots of photos” is not a number.
2. **Multiply** — count × typical size, one line per kind of file.
3. **Convert once** — bring everything to the same unit *before* you add it up. This is where the arithmetic usually goes wrong.
4. **Add the backup** — a second copy doubles the figure. Storage plans that forget this fail in month two.

Worked example. 500 photos ≈ 2 GB · 200 songs ≈ 1 GB · 10 hours of video ≈ 20 GB. Total ≈ 23 GB — so a 32 GB drive looks fine until you remember the backup copy, and then it is not. Answer: 64 GB.

5 · Check yourself

1. Why does a cheap laptop with an SSD often feel faster than an expensive one with a hard drive?
2. A learner has 300 photos, 40 hours of video and a folder of documents. Roughly how much storage, with a backup?
3. A machine has plenty of free disk space but crawls with ten programs open. Which component is short, and why does disk space not help?
4. Inkjet or laser for a school office that prints 2 000 pages of text a month? Justify it.
5. Give one example each of softcopy and hardcopy output of the same document.

Activities for this lesson

Activity 1 — Specify a lab. Choose the monitors and one printer for a 25-seat computer lab, with the specification and the reason for each choice, including the cost per page of the printer. The reasons carry the lesson, not the brand names.

Activity 2 — Storage maths. Given a list of files with sizes, calculate the total, convert between units, and recommend which storage type fits — including one backup copy. Show the working, not only the answer.

Neither activity carries marks. Both are rehearsals for the Checkpoint marked task, which asks the same thinking about a whole machine.

Glossary

Softcopy	Output that can only be seen on a screen.
Hardcopy	Output you can hold, such as a printed page.
Volatile	Lost when the power goes — the defining property of RAM.
Resolution	The number of pixels a display shows, and so how sharp it looks.
Cost per page	The running cost of printing, which usually matters more than the price of the printer.

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