

System software

Printable handout — the half of software you never chose to install: the operating system, the drivers and the utilities.

Why this half is worth understanding

System software runs before you log in and is still running after you close everything. You notice it only when it fails — which is exactly why the people who understand it fix problems that everybody else restarts the machine over.

Objectives

1. Distinguish system software from application software and justify the classification.
2. Describe five jobs the operating system does that are never visible when they work.
3. Explain what a driver does and what happens when the wrong one is installed.
4. Name three utilities and say what each one protects the machine from.

1 · What software is

Software is a set of written instructions, stored electronically, that tells the hardware exactly what to do, in what order, and what to do when something goes wrong.

That last phrase is the one students skip. Handling failure is most of what software actually contains; the happy path is the easy part.

Quality	What it means
Written in code	By people, in a language people can read, then translated for the machine — which is why it has bugs.
Stored, not wired	It sits on the drive and is loaded into memory when you open it. This is what separates a computer from a calculator.
Updated	Bugs are fixed and features added long after you bought the device.
Licensed	You almost never own software — you own permission to use it. Lesson 2 covers this.

2 · Two families of software

	System software	Application software
What it does	Runs the machine itself.	Helps you do a task.
Examples	Operating system, drivers, utilities, firmware	Word processor, browser, game, editor

Who is it for?	The computer	The user
When does it run?	From boot to shutdown	When you open it
Can you remove it?	Remove the OS and nothing works	Remove it and the machine is fine
Who notices it?	Only when it fails	Constantly

Quick test. If it exists to keep the computer running, it is system software. If it exists to get your work done, it is application software. *Antivirus feels useless because it writes no essays — but it serves the machine and runs from boot to shutdown, so it is system software.*

3 · Five jobs the operating system does

All of these are happening right now on whatever you are reading this on, and none of them are visible when things go well.

Job	What it actually means
Manages memory	Decides which program gets which slice of RAM, and takes it back when the program closes.
Runs programs	Gives each running program a turn on the processor, thousands of times a second — which is why it looks as though everything runs at once.
Handles files	Keeps track of where every file physically sits on the drive, and who may open it.
Talks to devices	Uses drivers to translate between your software and the printer, camera or keyboard.
Provides the interface	Gives you the windows, menus and taps you actually interact with.

Windows, macOS, Linux, Android and iOS all do these same five jobs. They just look different doing them. When twelve programs are open and the machine crawls, the first two are under the most pressure.

4 · Drivers and utilities

The operating system cannot know about hardware that did not exist when it was written, and it cannot protect itself from everything. That is what these two are for.

Item	What it does — and what it protects you from
Driver	A small program that translates between the operating system and <i>one specific</i> piece of hardware. Windows cannot know about a printer released three years after it shipped, so the printer brings its own translator.

...when it is wrong	The device is not recognised, or half works: a printer that prints blank pages, a screen stuck at the wrong resolution, a scanner that appears but never scans. The hardware is fine; the translation is wrong.
Antivirus	Watches files and downloads for known malicious code. Protects you from programs that arrived pretending to be something else.
Disk cleanup	Removes temporary files and tidies how data sits on the drive. Protects you from a machine that fills up and slows down.
Backup and compression	Copies files somewhere else and squeezes them smaller. Protects you from losing everything when a drive dies — and drives die without warning.

Troubleshooting habit. When a device misbehaves the day after an update, suspect the driver before the hardware. Hardware rarely fails at exactly the moment software changed.

5 · Match the tool to the task

Application type	Use it when
Word processor	Text that people read: letters, essays, reports.
Spreadsheet	Numbers that must be calculated, sorted or charted — the formulas update themselves.
Presentation	Visual support while you speak. Slides carry headlines; you carry the detail.
Database	Thousands of structured records that must be searched and linked reliably.
Browser	Reaching software and information that lives on someone else's computer.
Media editor	Creating or changing images, audio and video.

The two mistakes people make: doing arithmetic in a word processor, and using a spreadsheet as a database.

6 · Check yourself

1. Antivirus software helps you get nothing done. Why is it still system software?
2. A printer worked yesterday and prints blank pages today, the day after an update. What do you suspect first, and why?
3. You have twelve programs open and the machine crawls. Which two operating system jobs are under the most pressure?
4. Name three utilities and the threat each one addresses.
5. Why does the same five-job list apply to Windows, macOS and Android alike?

Activities for this lesson

Activity 1 — Sort the list. Twenty programs from a real installed-apps list: sort each into system or application software with a one-line reason. The reason is what matters — use the four questions from section 2.

Activity 2 — Watch it work. Open Task Manager (Ctrl+Shift+Esc) or System Monitor. Find three processes nobody launched, and explain which of the five operating system jobs each belongs to. Submit a screenshot and the three explanations.

Neither activity carries marks. The marks for this topic are in the Checkpoint, which assesses Lessons 1–2 together.

Glossary

Operating system	The system software that manages the machine and everything running on it.
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Driver	A program that translates between the operating system and one specific piece of hardware.
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Utility	System software that maintains or protects the machine rather than doing your work.
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Process	A program, or part of one, currently running on the machine.
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RAM	Fast temporary memory holding whatever is open right now.
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