ANNEX A · WHAT IS AN OPERATING SYSTEM?

Name: _____ **Date:** _____

TASK 1 SORT THE SYSTEM

8 min · alone

Write one letter next to each item: **H** hardware · **S** system software · **A** application · **D** data · **U** user.

___ RAM stick	___ Firefox	___ Ubuntu	___ holiday.jpg
___ printer driver	___ you	___ keyboard	___ WhatsApp
___ Android	___ your saved game	___ SSD	___ calculator
___ Windows 11	___ the teacher	___ your contact list	___ UEFI firmware

DONE WHEN all 16 have a letter, and you can explain the driver and the firmware.

TASK 2 FIND YOUR OPERATING SYSTEM

4 min · alone

Open a terminal (**Ctrl + Alt + T**). Type each line, then press Enter:

```
cat /etc/os-release
uname -sr
```

NAME: _____ VERSION: _____ Kernel: _____

DONE WHEN you can say which operating system, which version and which kernel your PC runs.

TASK 3 ONE CHEF, THREE ORDERS

12 min · groups of 5

	Round 1: one after the other	Round 2: switch every 10 s
Second at which program C **started**		
Second at which **everything** was finished		

A program that is running is called a _____. Each turn is a _____. The part of the operating system that says “switch” is the _____.

DONE WHEN the table is full and the three words are written.

TASK 4 CATCH THE MANAGER AT WORK

30 min · alone

The five jobs of an operating system: **processes · memory · files · devices · users**. One command for each.

A · Processes. How many programs are running right now?

```
ps -e | wc -l
```

Processes: _____. Open the **Calculator** from the applications menu, then:

```
ps -e | grep -i calc
```

The first number is its process ID (PID): _____. Type `kill` and that number. What happened?

_____

DONE WHEN the Calculator closed without you touching its window.

B · Memory.

```
free -h
```

Row `Mem:` → total: _____ available: _____. Open Firefox with five tabs, run it again → available: _____

DONE WHEN you have two different numbers for “available”.

C · Files.

```
echo hello > note.txt
ls -l note.txt
```

Owner: _____ Size in bytes: _____ "hello" has 5 letters. Why that size?

_____

DONE WHEN you can point at the owner, the size and the date in the output.

D · Devices.

```
lsusb
```

Lines: _____. Unplug your mouse and run it again. Lines: _____. Which device disappeared?

_____

Plug it back in. Count the kernel modules (most are drivers) with `lsmod | wc -l` → _____

DONE WHEN the mouse works again and you know which line of `lsusb` it is.

E · Users.

```
whoami
id
cat /etc/shadow
```

My user: _____ My uid: _____ Answer of the last command:

_____

Why did the operating system answer that?

_____

DONE WHEN you can explain who said no, and why.

TASK 5 WHO DOES IT?

4 min · pairs

Write the job: **processes**, **memory**, **files**, **devices** or **users**.

	Situation	Job
1	Music keeps playing while you type in a document.	
2	A program tries to read another program's data in RAM and is stopped.	
3	You plug in a new webcam and it works.	
4	You cannot open your classmate's personal folder.	
5	A week later, your report is still in Documents with the same name.	
6	With 30 tabs open the PC gets slow: RAM is full and things go to the disk.	

TASK 6 EXIT TICKET

8 min · alone, no notes

1. Which is the best description of an operating system?

☐ a) The software that manages the hardware and serves the other programs
☐ b) The first program the CPU runs at power-on
☐ c) All the applications installed on a computer
☐ d) The chip that stores the programs

2. One CPU core, three programs open. How do all three make progress?

☐ a) The OS switches the core between them very fast
☐ b) The core is split into three smaller cores
☐ c) Two wait until the first one finishes
☐ d) RAM runs the other two programs

3. The command cat /etc/shadow answers "Permission denied". Which job of the OS is that?

☐ a) Processes
☐ b) Devices
☐ c) Users
☐ d) Memory

4. Which one is NOT system software?

☐ a) Ubuntu
☐ b) A printer driver
☐ c) Firefox
☐ d) Windows 11

5. You plug in a new USB keyboard and it works at once. What made that possible?

☐ a) The scheduler
☐ b) A driver
☐ c) The file system
☐ d) The bootloader