SEMtech!

Student Engagement & Mentoring in Technology

1. "File System Simulator" – Virtual File Explorer Activity

Objective: Teach students how files and directories are structured and managed by file systems.

How It Works:

- Learners interact with a **drag-and-drop file system interface** (similar to the Finder window shown in the image).
- They are given a **scenario** (e.g., "Organize project files into appropriate folders with correct names and extensions," or "Assign permissions to group members").
- Tasks include:
  - Creating folders and subfolders
  - Naming files with appropriate extensions
  - Assigning read/write/execute permissions
  - Identifying valid vs. invalid file names

Why It Works:
Promotes **hands-on learning** in a simulated environment that mimics real OS behavior. Builds confidence in navigating file structures and managing files responsibly.

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2. "Secure or Not?" – File System Feature Identification Game

Objective: Reinforce knowledge of file system capabilities (encryption, compression, journaling).

How It Works:

- Students are presented with a **series of flashcard-style prompts**: e.g., "This file system supports encryption and journaling but no compression."
- They must **select the correct file system** from choices like:
  - NTFS
  - FAT32
  - ext4
  - HFS+
  - APFS
- Optional: Include **bonus rounds** where learners match the file system to the OS (e.g., "Used by Linux" → ext4).

Why It Works:
Strengthens **recall and comparison skills**. Ideal for reinforcing file system features needed for ITF+ exam prep.

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3. "Fix the Broken File System" – Troubleshooting Challenge

Objective: Apply understanding of file system behavior in real-world troubleshooting.

How It Works:

- Learners are given **a simulated log or scenario**, such as:
  - "Files were lost after a sudden shutdown. What feature could have prevented this?"
  - "User reports being unable to save a 10GB video to USB formatted in FAT32."
- They choose the correct explanation and solution:
  - "Journaling would have preserved system integrity."
  - "FAT32 does not support files over 4GB—reformat to exFAT or NTFS."

Why It Works:
Promotes **problem-solving and critical thinking**, applying foundational knowledge to practical tech support scenarios.

Summary Table

Interactive	Focus Area	Skill Developed
File System Simulator	File/folder structure, permissions	Organization, naming conventions, permissions
Secure or Not?	File system comparison	Feature identification and matching
Fix the Broken File System	Real-world application	Troubleshooting and solution analysis