



Activity 1: “Database vs. Flat File Showdown” (Interactive Sorting Game)

Objective: Reinforce the distinction between databases and flat files.

How it works:

- Create two large labeled areas: one for "Database" and one for "Flat File."
- Prepare a set of **data use case cards** (e.g., "Customer contact info," "Driving directions," "Inventory tracking," "Recipe steps," "University course list").
- In small groups, students **sort the cards** into the appropriate category.
- After sorting, each group must **justify** their decisions using concepts from the study guide (e.g., structure, scalability, concurrency).

STEM Linkage: Encourages systems thinking and categorization—a foundational skill in data science and IT systems.

Activity 2: “Build-a-Table Relay” (Team-based Schema Construction)

Objective: Practice structuring data into tables and understanding table anatomy.

How it works:

- Divide learners into teams.
- Present a data scenario (e.g., university course catalog, employee directory).
- Each team must **design a table schema** on a whiteboard or shared doc:
 - Define table name
 - Create column headers (fields)
 - Add sample rows of data
- Add a **relay twist**: One student starts and has 2 minutes to begin the schema, then passes it to the next teammate, and so on.

Wrap-Up Discussion: Review each team’s table, discuss choices, and connect them to real database principles like normalization and data types.

STEM Linkage: Reinforces data modeling and design thinking, crucial for roles in software engineering and data management.



Activity 3: “Query Quest” (SQL Roleplay Simulation)

Objective: Understand the stages of using a database, especially retrieval via queries.

How it works:

- Create a **mock database** on paper or using a simple DB tool (like DB Browser for SQLite or Airtable).
- Assign roles:
 - **DB Admin:** Handles creation and entry.
 - **User:** Submits questions (e.g., "What courses are taught in Spring 2023?")
 - **Query Specialist:** Writes a simplified SQL query (e.g., `SELECT * FROM Courses WHERE Semester = 'Spring 2023';`)
- Rotate roles every round.
- Use visual aids to simulate query execution and response.

Extension Option: Introduce SQL injection as a cybersecurity concept (tie-in with best practices for secure queries).

STEM Linkage: Combines technical communication, logic, and cybersecurity awareness—key elements in modern IT professions.