

User Needs and Planning the Database

200 minutes (5 periods)

Applied Learning Tasks (ALTs)

Outcome 3.1

Outcome 3.2

Outcome 1.15

Outcome 1.11

Outcome 1.20

Outcome 1.23

Outcome 2.1

WHAT THIS LESSON DOES

In this lesson, you'll explore how to identify user needs through user-centred design principles. You'll plan a database schema, assign team roles, discuss ethical considerations, and create an initial plan document to guide your interactive information system project.

CURRICULUM OUTCOMES

Outcome	What the specification asks for
3.1	understand and list user needs/requirements before defining a solution
3.2	create a basic relational database to store and retrieve a variety of forms of data types
1.15	consider the quality of the user experience when interacting with computers and list the principles of universal design, including the role of a user interface and the factors that contribute to its usability
1.11	discuss the complex relationship between computing technologies and society including issues of ethics
1.20	collaborate and assign roles and responsibilities within a team to tackle a computing task
1.23	reflect and communicate on the design and development process
2.1	use abstraction to describe systems and to explain the relationship between wholes and parts

WHAT STUDENTS SHOULD BE ABLE TO DO

- Understand the principles of user-centred design to prioritise user needs in system development.
- Identify and define user requirements to guide effective database planning.
- Design a database schema using abstraction to organise data efficiently.
- Collaborate effectively by assigning team roles and responsibilities for project tasks.
- Evaluate ethical considerations to ensure responsible and inclusive database design.

BEFORE THE LESSON

- Confirm students can reach a shared word processor and a shared document space, Google Docs or Microsoft Word, and are logged in so teams can write to one file together.
- Have a worked schema example ready to show, tables, fields and one relationship, drawn from an earlier Databases unit so students recognise the format.
- Decide before class whether teams keep the project you began earlier or start fresh, so role assignment builds on real prior work.

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HOW THE LESSON RUNS

Introduction

Team Role Assignment Activity

Understanding User-Centered Design

Defining User Needs

Planning the Database Schema

Ethical Discussion Prompts

Developing Your Plan Document

TEACHING MOVES

- 2. Team Role Assignment Activity. Cap this at 15 minutes and insist roles are written into the shared document, not just spoken. Steer schema planning toward whoever was strongest in the Databases unit, and check no team leaves one person doing everything.
- 3. Understanding User-Centered Design. Anchor empathy, iteration and usability with the library-search example, then have each team name their own real users out loud before moving on. Stress it is a cycle, not a checklist done once.
- 4. Defining User Needs. Push teams to list distinct user groups with different goals, students viewing grades versus teachers updating them. Have them separate functional needs from wishes. This is the abstraction move: only real needs enter the schema.
- 5. Planning the Database Schema. Work one entity into a table on the board with them, showing fields and a relationship. Remind them the schema models only essential detail. Have each team sketch entities before they name any fields.
- 6. Ethical Discussion Prompts. Run this as spoken discussion, not written answers. Focus on data privacy: challenge teams to justify every personal field, and cut anything like home addresses they cannot defend as necessary.
- 7. Developing Your Plan Document. Give a clear structure to fill: users and needs, schema, ethics decisions, roles. Ask for headings, bullet points and a schema sketch. Collect or review one plan per team before they start building.

WHAT TO WATCH FOR

- Students treat the schema as a fixed answer to get right once, rather than a plan they will revise as user needs sharpen. Point back to the iteration principle. Tell them the first schema is a draft and ask what might change once they test it with a user.
- Teams over-collect data, adding fields like phone numbers or addresses because they might be useful, missing the privacy point. For every field, ask which user need requires it. If they cannot name one, the field comes out. Tie this back to the ethics prompt.
- Students confuse an entity with a single field, so a whole table collapses into one column. Ask what real-world thing the data describes. A student is an entity with many fields, a grade is a field. Show one entity fully before they draw their own.

DIFFERENTIATION

- Emerging: Give a partly filled plan template with the headings already in place so the student adds content rather than inventing structure. Pair them with the team Documenter and ask them to describe their main user aloud before writing anything down.
- Developing: Ask them to justify one schema choice: why this table, why these fields, why this relationship, before they finalise it. Have them trace one user need all the way through to the field that serves it.
- Proficient: Push toward Higher Level treatment: ask them to identify primary keys and how two tables relate, and to name a normalisation problem in their draft. Have them write the privacy and inclusivity decisions up as evidence they could use in an Applied Learning Task.