PROFESSIONAL LEARNING · FOR THE TEACHER

# Three ways of thinking in a database unit

A one-page planner that turns two pieces of professional learning into changes to the Ridgeview unit, and names what I still need to learn.

## The professional learning

| Source | Why I chose it |
|---|---|
| Digital Learning and Teaching Victoria (DLTV): *Module 1C: The 3 ways of thinking*, from the online workshop *Digital Technologies in your school* | It distinguishes Digital Technologies (creating, coding, data) from general ICT use, and names computational, design and systems thinking as the habits students bring into VCE Applied Computing. |
| VCAA (2024): *VCE Applied Computing 2025–2028: Background to Unit 1 Outcome 1* (slides) | The official account of what changed in U1O1: SQL added, naming conventions, and design tools including query designs and IPO charts. |

## From the module to the unit

| Way of thinking | What it means (DLTV, paraphrased) | Where it shows up in Ridgeview | Resource |
|---|---|---|---|
| Computational | Decomposition, pattern recognition, abstraction, algorithm design. | Decompose the flat sheet into entities; spot repeated values as a sign of a hidden entity; abstract to the fields the purpose needs; write a query as precise steps. | R1, R2, R4 |
| Design | Understand users, define, ideate, prototype, test. In secondary, the problem-solving methodology (analyse, design, develop, evaluate) and 'How might we…' framing. | *How might we let the office print accurate rolls without storing more personal data than it needs?* Requirements drive the ERD; the test table and evaluation close the loop. | R5, R6 |
| Systems | Connections and dependencies: changing one part affects the whole. | Moving Robotics to D06 ripples through every row of a flat file but one row of a database; data decisions affect people (privacy). | R1, R5 |

## What the VCAA briefing changed in my plan

- **Query designs.** My first draft of the unit went straight from questions to SQL. R4 now asks students to plan each query (tables, fields, condition) before writing it.
- **Naming conventions.** The Lesson 2 convention (singular tables, EntityID keys, no spaces) is now used in the schema and every query, so students meet one consistent standard.
- **Data quality factors.** The briefing names accuracy, bias, integrity, relevance and reliability. R6 now asks students to evaluate at least two of them, and the teacher model shows three.
- **Assessment options.** U1O1 can be assessed through a folio of exercises or a solution to teacher-provided

requirements. The Ridgeview Challenge and the R6 rubric fit the second.

## My professional learning goals

| Where I need support | Action | Network or resource |
|---|---|---|
| Teaching SQL to novices: which errors to expect and when to step in | Read Miedema et al. (2021) on SQL misconceptions; use R4 Investigate answers as diagnostic data | Research literature; my mentor's SQL experience |
| Moving students from DB Browser to a Python interface without losing weaker programmers | Ask experienced Applied Computing teachers how they scaffold a Python interface for a database, and trial R4's extension with a small group | School faculty; DLTV community |
| Keeping up with Study Design support materials and exam reports | Subscribe to VCAA Applied Computing updates; attend one VCAA or DLTV session per term | VCAA professional learning; DLTV webinars and conference |

**A question to take to my mentor**

Students can draw an ERD and still build tables that contradict it. At what point do you insist on a teacher-checked ERD before students start building, and what does that check look like?

Planner by Arvin Hay. Sources: Digital Learning and Teaching Victoria. (n.d.). Module 1C: The 3 ways of thinking. In Digital Technologies in your school [Online workshop]. https://sites.google.com/dltv.vic.edu.au/virtual-workshop/home/module-1c-the-3-ways-of-thinking. Victorian Curriculum and Assessment Authority. (2024). VCE Applied Computing 2025–2028: Background to Unit 1 Outcome 1 [PowerPoint slides]. https://vcaa.vic.edu.au/Documents/vce/computing/professionallearning/VCEAppliedComputing2025-2028Unit1Outcome1.pdf