LESSON 91

Building the Analytics Artefact

320 minutes (8 periods) | Applied Learning Tasks (ALTs) | Outcome 1.19 | Outcome 1.22 | Outcome 1.23 | Outcome 2.20 | Outcome 2.21 | Outcome 3.6 | Outcome 3.7

WHAT THIS LESSON DOES

In this lesson, you'll create your analytics artefact by planning its structure, integrating data and algorithms, developing visualisations, enhancing usability, testing functionality, and refining based on review. By the end, your artefact will clearly present your analysis and insights.

CURRICULUM OUTCOMES

Outcome	What the specification asks for
1.19	identify features of both staged and iterative design and development processes
1.22	read, write, test, and modify computer programs
1.23	reflect and communicate on the design and development process
2.20	identify and fix/debug warnings and errors in computer code and modify as required
2.21	critically reflect on and identify limitations in completed code and suggest possible improvements
3.6	represent data to effectively communicate in a graphical form
3.7	use algorithms to analyse and interpret data in a way that informs decision-making

WHAT STUDENTS SHOULD BE ABLE TO DO

- Understand the process of designing and structuring an analytics artefact to effectively present data insights.
- Develop skills in integrating data and algorithms into a cohesive and functional artefact.
- Enhance the usability and clarity of the artefact through effective presentation techniques.
- Apply testing methods to ensure functionality and reliability of the artefact.
- Refine the artefact iteratively based on self-review to align with project goals.

BEFORE THE LESSON

- Confirm each student can locate their processed dataset and their earlier calculation code, since this lesson assumes both exist and are reachable.
- Test that the chosen environment plots and saves correctly on a room machine: Python with Matplotlib and Pandas installed, or whatever format students picked. A missing library stalls the whole session.
- Have a simple test dataset with a known mean and median ready so students can verify their calculations against hand-worked values.

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HOW THE LESSON RUNS

Introduction
Artefact Format
Plan Artefact Structure
Integrate Data and Algorithms
Enhance Usability and Presentation
Test Functionality Internally
Refine Based on Self-Review

TEACHING MOVES

- 2. Artefact Format. Push students to pick a format they can actually finish, not the most impressive one. A clear document beats a broken interactive website. Tie the choice to their own skills and the time left.
- 3. Plan Artefact Structure. Insist on a paper sketch before any code. Each planned section should map to part of the hypothesis. If a chart does not help answer the hypothesis, question why it is there.
- 4. Integrate Data and Algorithms. Watch for hard-coded numbers copied in from a spreadsheet. The artefact should recompute from the loaded data so it stays correct if the dataset changes. Test the data loads before building on it.
- 5. Enhance Usability and Presentation. Every chart needs a title, axis labels and a one-line explanation of what it shows about the hypothesis. An unlabelled chart is not evidence. Check colour contrast for readability.
- 6. Test Functionality Internally. Have them verify at least one calculation by hand against the known-value dataset. Running twice on the same data should give identical output. A checklist of passed and failed tests is good project evidence.
- 7. Refine Based on Self-Review. Require the changes to be documented: what was refined and why. This record of iteration is exactly the reasoning examiners want, so treat the note as part of the deliverable, not an afterthought.

WHAT TO WATCH FOR

- Students believe an artefact that looks polished is therefore correct, without checking the numbers behind it. Make them prove one figure by hand against known data before they style anything. Looking right and being right are different things.
- Values are pasted in as fixed text rather than computed from the data, so charts no longer match the dataset. Ask them to change one row of source data and confirm the output updates. If it does not, the artefact is not built on the algorithm.
- Confusing this in-class artefact with the externally assessed Coursework Project. Clarify that this is part of an Applied Learning Task: formative practice, not the graded 30% submission. The skills transfer, the grade does not.

DIFFERENTIATION

- Emerging: If the environment is fighting them, steer them to the document format so effort goes into analysis rather than debugging a plotting library. Give a filled-in structure template so they start integrating data instead of stalling on the plan.