

Design in context · supported focus

Supported focus · HL

Supported scope

- Supported HL focus. First assessment 2027 target; current brief and public guide return 403; 2016 SL/HL briefs are historical. Remaining guide, assessment and practical requirements retain their recorded holds.
- State model conditions and distinguish fictional data from measurements.

Design Lifecycle · 1.1

Reasoning

A repairable product may cost more initially but stay in service longer. A design decision needs evidence across manufacture, use and disposal. Start with a prediction. State the quantities or features you would compare, then decide what evidence could distinguish two explanations.

Design Lifecycle · 2.1

Reasoning

Design for disassembly supports separation of materials and replacement of parts. Manufacturing choices depend on production volume, tolerances, material properties and cost. Sustainability includes environmental and social effects.

design for disassembly: Design supporting separation and replacement of parts;
tolerance: An allowed dimensional variation.

Design Lifecycle · 3.1

Reasoning

Compare a common service over a stated lifetime. Separate fixed tooling cost from cost per item. Include repair, energy, transport and realistic end-of-life pathways rather than using a recycled label as the whole judgement. Create a bill of materials and an annotated assembly plan. Test whether a worn part can be replaced with normal tools. For HL project development, evaluate production feasibility and commercial assumptions against the applicable cohort guide.

Design Lifecycle · 4.1

Reasoning

State the known values and their units. Choose the relation because its assumptions fit this case, then rearrange before substitution. Known: method A costs 600 fixed units plus 4 per item; method B costs 100 fixed units plus 9 per item. Equality: $600 + 4n = 100 + 9n$. Rearranging: $500 = 5n$, so $n = 100$ items. Other quality and sustainability criteria may change the choice.

Design Lifecycle · 4.2

Reasoning

Fixed costs differ by 400 units and unit costs differ by 5. Find cost break-even quantity. Use the same sequence: known quantities $\rightarrow$ model $\rightarrow$ relation $\rightarrow$ substitution $\rightarrow$ unit and interpretation.

Design Lifecycle · 5.1

Reasoning

A cheaper process is not automatically preferable. Cost estimates need currency, quantity and assumptions, and prototypes do not prove mass-production consistency. Return to the original observation. Explain what the result supports, which conditions it assumes, and one way to test a competing explanation.

Design Lifecycle · 5.2

Reasoning

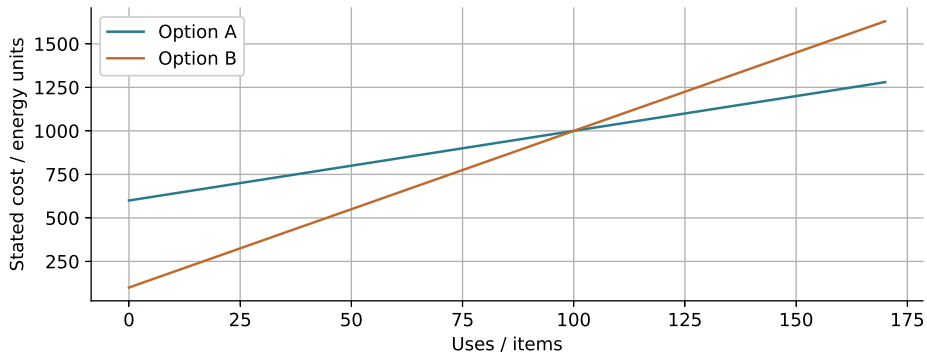
A recycled-content label establishes the entire product life-cycle impact. This claim is false: A cheaper process is not automatically preferable. Cost estimates need currency, quantity and assumptions, and prototypes do not prove mass-production consistency.

Design Lifecycle · 5.3

Reasoning

Design sustainability and production choices: Compare a common service over a stated lifetime. Separate fixed tooling cost from cost per item. Include repair, energy, transport and realistic end-of-life pathways rather than using a recycled label as the whole judgement.

Design Lifecycle · diagram



- Original teaching diagram: Design sustainability and production choices
- Use the labels and the stated model together.

Design Lifecycle · original transfer

Your turn

Methods cost $A=500+3n$ and $B=100+7n$. Find break-even and compare at 50 and 150 items. Why is cost alone insufficient?

Design Lifecycle · transfer reasoning

Method and interpretation

Equality at 100. At 50: A650,B450; at 150: A950,B1150. Quality, capacity, waste, usability and lifecycle evidence may outweigh money cost.

Check yourself

- Explain design for disassembly using the stated model.
- Explain tolerance using the stated model.
- Change one value in the original transfer; explain which assumption still matters.