Design project

International Baccalaureate · IB Diploma · Design Technology · HL

Scope and prerequisites

This handout covers selected HL topics for the course first assessed in 2027; it is not the whole syllabus.

Prerequisites: read the stated quantities and units, and use arithmetic and the model conditions below.

The examples are original and fictional: they are not real measurements or real student investigations.

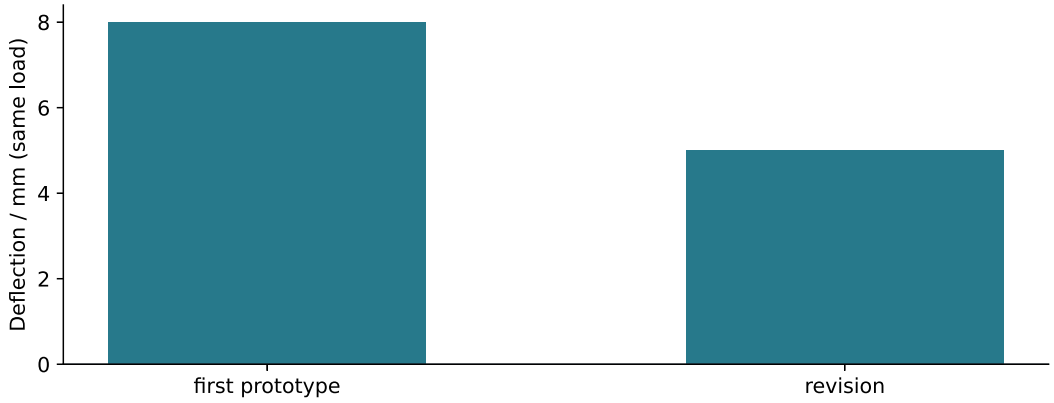
The design project: fit, models and evidence

What would explain this observation?

- A locker shelf built to the average student height fits nobody: the tall cannot reach past it, the short cannot see under it. Design is the fit between people, tasks and products, and an average is not a fit.

Build the model

- Choose anthropometric data for the target population and the task.
- Clearance often needs a larger-user **percentile** ; reach may need a smaller-user percentile.
- A single mean dimension cannot satisfy every design constraint.
- A **model** is a developing version used to test a solution.
- percentile: The value below which a stated share of the population falls.



Deflection falls from 8 mm to 5 mm under the same load: a 3 mm, 37.5% reduction

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Choose evidence that can test it

- Observe an approved low-risk task with consent; interview users without leading questions.
- Record measurable **success criteria** before building.
- Test an early model before committing to expensive materials.
- State what each model includes and omits; compare tests under the same load, geometry and conditions.

In the lab: Make a low-risk model under school workshop rules; record dimensions, material, process and test method; photographs, measurements and user feedback are the evidence.

Work from known quantities

- Known: the shelf must clear the 95th-percentile bag (clearance, larger users) and stay within the 5th-percentile reach (reach, smaller users).
- Success criteria: a loaded school bag retrievable in 10 seconds, one-handed, from a seated position.
- Cardboard model 1 tests fit only (geometry right, strength out of scope, stated).
- Ply model 2 repeats the same 5-kilogram load test: the comparison is like-for-like.

Your turn: A handle must suit grip width and door thickness. Which percentiles would you ask for first?

Check the conclusion and its limits

- Iteration means using evidence to revise a solution and testing the revision against the original success criteria.
- A model that changes two variables at once cannot attribute the improvement.

Not true: The next prototype is better because it is more advanced. Better is a judgement against the original success criteria under the same conditions.

Key:

- Percentile by constraint: clearance large, reach small.
- Success criteria measurable before the first model.
- Watch for: two variables changed between tests.

Write from a percentile choice

- Seat width is a clearance dimension; a control's placement is a reach dimension.
- Clearance takes the 95th percentile (fit the large), reach takes the 5th (serve the small) – percentile by constraint.

■ **Write from a measurable criterion**

- Replace comfortable with mean rating at least 4 of 5 across 10 users.
- A criterion measurable before the first model can be failed by it – that is its job.

■ **Write from a single-variable test**

- Two seat prototypes differ in tilt AND padding; users prefer the second.
- Neither variable's effect is isolated – change one, hold the rest, or the test answers nothing.

■ **Write from an iteration decision**

- Prototype 2 rates higher, but it changed two things at once.
- The next test isolates the single variable with the larger effect – one variable per iteration is what makes a design project learn.