Exercise walk-through

1.1 Designing for actual users

International Baccalaureate · IB Diploma · Design Technology · SL

INTERNATIONAL BACCALAUREATE · IB DIPLOMA · DESIGN TECHNOLOGY · SL • EXERCISE SHEET

1.1 Designing for actual users

Name: _____ Class: _____ Date: _____ **Total: 10 marks**

KEY WORDS ergonomics • specification

Objective

Designing for actual users. Original classroom practice for IB SL; not an official IB paper.

1 Key knowledge and worked examples

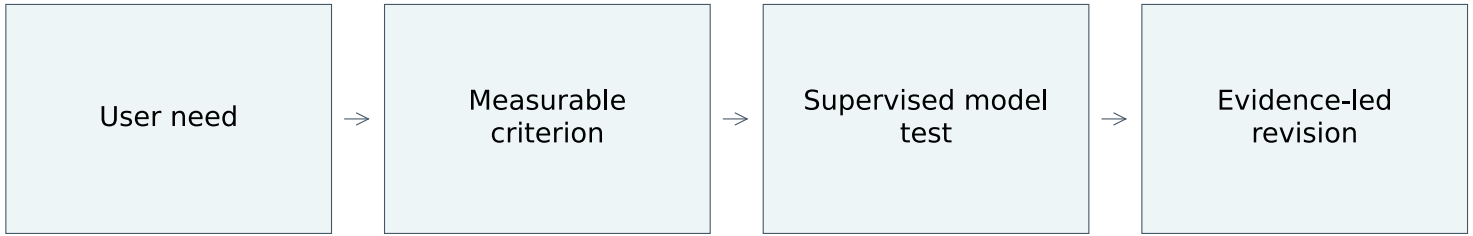
What would explain this observation?

- A handle that feels comfortable to its designer may exclude another user. Design evidence starts with the people and context of use.

Build the model

- Anthropometric data describe body dimensions.
- **Ergonomics** concerns the relationship between people, tasks and products.

- A design **specification** turns a user need into a measurable requirement.
- ergonomics: Designing the fit between people, tasks and products.
- specification: Measurable requirements a proposed solution should meet.



Choose evidence that can test it

- Choose data for the target population and task.
- Clearance often needs a larger-user percentile; reach may need a smaller-user percentile.
- A single mean dimension cannot satisfy every design constraint.

In the lab: Observe an approved low-risk task with consent, interview users without leading questions, and record measurable success criteria. Test an early model before committing to expensive materials. Do not collect unnecessary personal measurements.

Work from known quantities

- Known: a handle must withstand a 40 N use force with a design safety factor of 2.5.

- Target test load = use force × factor = 40×2.5 = 100 N.
- The factor is a design assumption to justify; it is not a substitute for a supervised safety review.

Your turn: A use force is 30 N and selected safety factor 3. Find target load.

■ Check the conclusion and its limits

- A specification is not a list of vague wishes such as nice or strong.
- User testing should evaluate measurable requirements and reveal conflicting needs.

Not true: A population mean dimension always accommodates every user. Designing for the mean fits the middle of a distribution and excludes the tails - often half the users. Ranges and percentiles, not the mean alone, decide accommodation.

Key:

- Anthropometric data describe body dimensions.
- Choose data for the target population and task.
- Watch for: A specification is not a list of vague wishes such as nice or strong.

■ Write from a target load of 80 N

- A handle must withstand a 20 N use force. The selected safety factor is 4.
- Find the target test load. The factor is a design assumption, not a safety review.

Exercises 2.1·2.3

2.1 Which is a testable requirement? Choose one answer.

- **A** The designer must like it
- **B** The handle must sustain a defined 100 N supervised test load
- **C** The handle must be nice [1]

2.2 A use force is 30 N and selected safety factor 3. Find target load. Show the relation, substitution and units. [2]

2.3 Decide whether this claim is true and justify: A population mean dimension always accommodates every user. [2]

Exercises 2.1·2.3

2.1 Which is a testable requirement? Choose one answer.

- **A** The designer must like it
- **B** The handle must sustain a defined 100 N supervised test load
- **C** The handle must be nice [1]

2.1 B A testable requirement states a measurable quantity and pass condition, such as sustaining a defined 100 N supervised test load. “Nice” and designer preference cannot be measured or checked against evidence.

2.2 A use force is 30 N and selected safety factor 3. Find target load. Show the relation, substitution and units. [2]

2.2 target load=use force×selected factor=30×3=90N.

2.3 Decide whether this claim is true and justify: A population mean dimension always accommodates every user. [2]

2.3 False. Designing for the mean fits the middle of a distribution and excludes the tails - often half the users. Ranges and percentiles, not the mean alone, decide accommodation.

Exercises 2.4·3.1

2.4 Designing the fit between people, tasks and products: write the technical term. [1]

3.1 Fictional users require one-handed opening below 15 N; a prototype needs 18±1 N. Evaluate this criterion and propose a measurable revision test. [4]

Exercises 2.4·3.1

2.4 Designing the fit between people, tasks and products: write the technical term. [1]

2.4 ergonomics. ergonomics means Designing the fit between people, tasks and products.

3.1 Fictional users require one-handed opening below 15 N; a prototype needs 18±1 N. Evaluate this criterion and propose a measurable revision test. [4]

3.1 Even 17 N exceeds 15 N, so this evidence fails the criterion. Revise and repeat force measurements with representative users and conditions. Passing one criterion does not certify every need.