

Design & Technology

AQA A-Level

Prototype development

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- For the multiple choice questions, circle your answer

Advice

- Marks for each question are in brackets
- Read each question fully
- Try to answer every question
- Don't spend too much time on one question

Good luck!

Q1. What is the main purpose of developing a prototype from design proposals?

- A** To replace the final product entirely
- B** To test and refine ideas before final production
- C** To save time by skipping earlier design stages

Q2. How can prototyping help in the NEA project?

- A** It allows students to evaluate and improve their design ideas
- B** It removes the need for a design specification
- C** It ensures the product costs less to manufacture

Q3. Why is it important for a prototype to meet the needs of identified users?

- A** To match competitors' products
- B** To fulfil the purpose and improve user satisfaction
- C** To reduce the number of components used

Q4. What should influence the development of a prototype in the NEA?

- A** The cheapest materials available
- B** The student's personal preferences only
- C** The original design proposals and user needs

Q5. Explain how different prototyping methods may be used in the development of a screwdriver handle **(4 marks)**

Answers

Q1. B

Q2. A

Q3. B

Q4. C

Q5.

Methods:

- Physical/visual prototype to check handle ergonomics with a focus group
- 3D CAD prototype to check aesthetics and colour schemes for branding
- Sketch prototypes for client feedback before CAD modelling
- 3D CAD prototype to check costings with different materials
- FEA prototype to check forces, such as torsion and impact
- Mould flow analysis to check forming processes
- Working prototypes to assess movement of components within the handle.