

Assessment

Criterion	A	B	C	D	E	F
Level achieved	6	7	6	5	6	8

Criterion A: Analysis of a design opportunity

Maximum: 9

Marks	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–3	<p>The student:</p> <ul style="list-style-type: none"> • identifies a problem • states the key findings from relevant market and user research • <u>develops a simple brief, which identifies few relevant parameters of the problem</u> • <u>develops a marketing specification, which states the requirements</u> • develops a design specification, which states the requirements.
4–6	<p>The student:</p> <ul style="list-style-type: none"> • identifies an appropriate problem, which leads to a design opportunity • describes the key findings from relevant market and user research • develops a brief, which identifies some of the relevant parameters of the problem • develops a marketing specification, which outlines the requirements • develops a design specification, which outlines the requirements.
7–9	<p>The student:</p> <ul style="list-style-type: none"> • <u>describes an appropriate problem, which leads to a design opportunity</u> • <u>explains the key findings from relevant market and user research</u> • develops a detailed brief, which identifies the relevant parameters of the problem • develops a marketing specification, which justifies the requirements • <u>develops a design specification, which justifies the requirements.</u>

This work achieved level 6 because the student:

- describes an appropriate problem and supports the description of this with images; the design opportunity is clearly established through a client interview and questionnaire results (pages 1, 2)
- explains the key findings from relevant market and user research, which is supported by product analysis of similar products (pages 3, 4), a brief analysis of the market, that is, the

types of shops that the product would be sold in (page 4), the collection of dimensional research in relation to product size and anthropometric data relating to hand size (page 5)

- develops a simple design brief, which identifies a few relevant parameters (page 3)
- develops a design specification, which justifies the requirements (page 6); the requirements are specific, feasible and measurable and the design specification draws from the research.

The student would have achieved a higher level if he or she had:

- included detail of the broad requirements in the design brief by summarizing the main points from the research
- developed a separate marketing specification, which clearly established the target market and target audience; analysed the market in terms of potential users, size and economic viability of a solution; identified the essential requirements related to user need; and analysed the competition
- included further measurable constraints from the research in the design specification.

Criterion B: Conceptual design

Maximum: 9

Marks	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–3	The student: <ul style="list-style-type: none"> • demonstrates limited development of few ideas, which explore solutions to the problem • selects the most appropriate idea for detailed development with no justification.
4–6	The student: <ul style="list-style-type: none"> • <u>develops ideas with reference to the specifications which explore solutions to the problem</u> • uses concept modelling with limited analysis • selects the most appropriate idea for detailed development with limited justification.
7–9	The student: <ul style="list-style-type: none"> • develops feasible ideas to meet <u>appropriate specifications</u>, which explore solutions to the problem • <u>uses concept modelling to guide design development</u> • <u>justifies the most appropriate idea for detailed development</u>.

This work achieved level 7 because the student:

- develops ideas to meet appropriate specifications, which explore solutions to the problem; the initial development of designs is evidenced on pages 7–9, with further development of the ideas, incorporating the initial designs presented (pages 10–13)
- uses concept modelling to guide design development through the use of 2D and 3D sketching (pages 7–9, 11–13), CAD modelling (page 10) and card modelling (page 17)

- justifies the most appropriate idea for detailed development against each of the appropriate design specification points (page 14).

The student would have achieved a higher level if he or she had:

- added further annotation explaining design thinking and linked the initial ideas to the specification on pages 7–9
- used the concept models to gather further feedback from the client or target market.

Criterion C: Development of a detailed design

Maximum: 9

Marks	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–3	The student: <ul style="list-style-type: none"> • lists some appropriate materials and components for a prototype • lists some appropriate manufacturing techniques for prototype production • develops a design proposal that includes few details • produces an incomplete plan that contains some production details.
4–6	The student: <ul style="list-style-type: none"> • <u>outlines some appropriate materials and components for a prototype</u> • <u>outlines some appropriate manufacturing techniques for prototype production</u> • <u>develops a design proposal that includes most details</u> • <u>produces a plan for the manufacture of the prototype.</u>
7–9	The student: <ul style="list-style-type: none"> • justifies the choice of appropriate materials and components for a prototype • justifies the choice of appropriate manufacturing techniques for prototype production • develops an accurate and detailed design proposal • produces a detailed plan for the manufacture of the prototype.

This work achieved level 6 because the student:

- outlines some appropriate materials and components for the prototype: acrylic (page 18), MDF (page 17), magnetic metal, clarified as steel (page 20) and electronic components (page 17), joining components (page 18) and finishing materials (page 20)
- outlines some appropriate manufacturing techniques for prototype production including laser cutting, drilling, joining and finishing methods (page 18)
- develops a design proposal that includes most details, including part and assembly drawings (page 19)

- produces a plan for manufacture, evidenced through the flow diagram and Gantt chart (page 20).

The student would have achieved a higher level if he or she had:

- provided further justification for materials and component choice, considering cost, supply and required material properties (physical, mechanical and aesthetic)
- provided a rationale for why the manufacturing techniques were chosen compared with other options and detail of the electronic components and circuit/wiring used including how it was part of the assembly
- included further detail in the plan such as required resources and tools sufficient for a third party to make the product.

Criterion D: Testing and evaluation

Maximum: 9

Marks	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–3	The student: <ul style="list-style-type: none"> • <u>evaluates the success of the solution against few aspects of the marketing specification with testing</u> • evaluates the success of the solution against few aspects of the design specification with • lists how the solution could be improved.
4–6	The student: <ul style="list-style-type: none"> • evaluates the success of the solution against some aspects of the marketing specification • <u>evaluates the success of the solution against some aspects of the design specification</u> • outlines how the solution could be improved.
7–9	The student: <ul style="list-style-type: none"> • evaluates the success of the solution against the marketing specification • evaluates the success of the solution against the design specification • explains how the solution could be improved.

This work achieved level 5 because the student:

- evaluates the success of the solution against few aspects of a marketing specification with no evidence of testing, that is, target audience, target market and competition (page 22)
- evaluates the success of the solution against some aspects of the design specification (page 23)
- outlines how the solution could be improved based on identifying the weaknesses through evaluation (page 23).

The student would have achieved a higher level if he or she had:

- evaluated the success of the solution against the user need; more explicit links between the testing and evaluation would be beneficial to show how the evaluation linked with the marketing specification, and the student would have been able to evaluate against the marketing specification if it was better established before conceptual design was started
- evaluated the success of the solution against all aspects of the design specification, demonstrating how each aspect was addressed through testing
- explained how the solution could be improved in further detail by providing revised specifications, annotated photographs and drawings or CAD.

Criterion E: Commercial production

Maximum: 9

Marks	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1-3	The student: <ul style="list-style-type: none"> • lists appropriate materials and components for commercial production • <u>lists</u> appropriate manufacturing techniques for commercial production • lists design modifications to the solution required for commercial manufacture.
4-6	The student: <ul style="list-style-type: none"> • <u>outlines</u> appropriate materials and components for commercial production • outlines appropriate manufacturing techniques for commercial production • outlines design modifications to the solution required for commercial manufacture.
7-9	The student: <ul style="list-style-type: none"> • justifies the choice of materials and components appropriate for commercial production • justifies the choice of manufacturing techniques appropriate for commercial production • <u>explains</u> design modifications to the solution required for commercial manufacture.

This work achieved level 6 because the student:

- outlines appropriate materials and components based on the chosen manufacturing technique (page 24)
- lists appropriate manufacturing techniques, considering scale of production and production runs (page 24)
- explains design modifications to the solution required for commercial manufacture, including considerations for drawing angles for a mould, modified assembly, interior of product redesigned to accommodate the electronics and steel baseplate (page 24).

The student would have achieved a higher level if he or she had:

- justified why ABS was selected, considering cost, supply and required material properties (physical, mechanical and aesthetic)
- justified why injection moulding was selected over other commercial manufacturing techniques, considering supply, material choice and working properties of the material.

Criterion F: Marketing strategies

Maximum: 9

Marks	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1–3	The student: <ul style="list-style-type: none"> • states a target sales price • lists some promotional strategies for the solution.
4–6	The student: <ul style="list-style-type: none"> • identifies a target sales price • identifies appropriate promotional strategies for the solution.
7–9	The student: <ul style="list-style-type: none"> • <u>justifies an appropriate target sales price</u> • <u>discusses appropriate promotional strategies for the solution.</u>

This work achieved level 8 because the student:

- justifies an appropriate target sales price by considering sales volume and using cost-plus pricing, competitor-based pricing and psychological pricing strategies (page 25)
- discusses appropriate promotional strategies for the solution, considering brand identity, internet sales, in-store sales and personal selling (page 25).

The student would have achieved a higher level if he or she had:

- provided justification for the chosen brand name and logo
- provided some detail of packaging and/or point of sale using annotated photographs, diagrams or sketches.