

GCSE Design and Technology – NEA Guide

2.3 Development of design ideas into a chosen design (AO1 4 marks, AO2 8 marks)

Exemplars of 2.3 Development of design ideas into a chosen design

Use [this live link](#) to view the latest exemplar materials for this assessment grid.

Stage	What students need to do:
2.3 Development of design ideas into a chosen design	2.3a Consideration of user group needs and preferences, of design ideas, conducting further research where necessary.
	2.3b Consideration of the design as a whole, rather than focussing on component parts in isolation.
	2.3c Modelling/simulation used to test the features of the design ideas.
	2.3d Analysis and evaluation of the design ideas, to inform choice as to the chosen design to take forward.
	2.3e Modification of design ideas to produce the chosen design, which meets the design brief and product specification.
	2.3f Use of calculations to determine all material quantities and technical details of materials, processes and components that could be interpreted by a third party.

What the NEA content requires students to do:

2.3a Consideration of user group needs and preferences, of design ideas, conducting further research where necessary.

Students should conduct additional research which supports the refinement of the chosen initial idea towards a final design suitable for prototyping. Refinements should be focused on the areas in which the initial design failed to meet or only partially met criteria within the specification (i.e. a design idea fails to meet 3-4 key specification criteria would require 3-4 potentially smaller and more focused pieces of research to support resolving these issues). A priority for research should be given to performance/ functionality criteria, and meeting the users' identified needs and wants, so that valid testing can be carried out with the final prototype.

2.3b Consideration of the design as a whole, rather than focusing on component parts in isolation.

Students are required to make refinements which support an improvement against the specification criteria, as outlined above. In making changes to parts of the initial design, it is anticipated that this will in turn improve the whole design and require an ongoing consideration for intended and unintended consequences of refinements. (e.g. by changing the material, the construction approach will also likely need to change).

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2.3c Modelling/simulation used to test the features of the design ideas.

Students will gain credit for applying CAD, sketching, physical modelling and written evidence appropriately throughout development, which alongside 2.1 evidence, will inform the marks awarded for 2.4 Communication. If the student did not sketch any initial design ideas in 2.1, they must include sketches in 2.3 in order to avoid a negative impact on marks for 2.4 associated with graphical communication.

Physical modelling and/or application of CAD will support modifications that the student can identify as helping the design to meet specification criteria (i.e. not just modelling for the sake of modelling). Students can use modelling and CAD to generate calculations for materials, decide on processes, and choose between techniques to name some ideas. To support the making of a final prototype, the student may want to create any of the following:

- 3D visualisation.
- 2D plans, patterns or templates.
- Diagrams.
- Use of mathematics for calculations (such as surface area, volume, weight, length, etc).
- Engineering or working drawing.
- A cutting list/bill of materials
- CAD files for CAM.

2.3d Analysis and evaluation of the design ideas, to inform choice as to the chosen design to take forward.

Students are required to communicate how they are developing their design idea towards a final design, through analysing their options and evaluating their choices as an ongoing activity. This should include making appropriate, purposeful judgements and decisions that improve the design towards meeting the specification, and may appear as annotation in this section.

2.3e Modification of design ideas to produce the chosen design, which meets the design brief and product specification.

Students should present a “final design” within the evidence for development. The chosen design should be recognisable as:

1. Being a response to the contextual challenge and design brief.
2. Aiming to meet the specification criteria and the user wants/needs.
3. Be a design that appeared within the initial design ideas and has been improved through development.
4. A solution that has increasingly become more refined and improved against specification criteria, particularly those that were not met or only partially met.

2.3f Use of calculations to determine all material quantities and technical details of materials, processes, and components that could be interpreted by a third party.

Students should be capable of developing a final design sufficient in detail and consideration so that another person with D&T knowledge such as a D&T teacher, can interpret the intentions for making. The student needs to communicate:

- The materials and their approximate quantities and measurements.

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- The intended processes to be used to shape and join those materials.
- The components made or bought in (off the shelf) that will be required to create the prototype.

This evidence supports a judgement of a students' capability within the D&T subject to plan the making of a prototype. Evidence does not need to be detailed beyond the need of a D&T teacher to attempt the manufacture themselves without instruction.

Level	Mark	2.3 Development of design ideas into a chosen design (AO1 4 marks, AO2 8 marks)
	0	No rewardable material.
Level 1	1–3	<ul style="list-style-type: none"> • Limited use of research to inform ongoing developmental changes. • Basic refinements of design ideas and a design solution that partially meets the design specification, informed by the basic application of technical knowledge of materials and a limited application of modelling/simulation techniques. • Chosen design idea shows superficial technical details of some materials and components that could be interpreted by a third party.
Level 2	4–6	<ul style="list-style-type: none"> • Some appropriate use of research to inform ongoing developmental changes. • Some sound refinements of design ideas and a design solution that generally meets the requirements of the design specification, informed by the generally sound application of technical knowledge of materials and/or processes and the mostly appropriate application of modelling/simulation techniques. • Chosen design idea shows generally appropriate application of calculations to determine some material quantities and technical details of most materials and components that could be interpreted by a third party.
Level 3	7–9	<ul style="list-style-type: none"> • Generally appropriate use of research to inform ongoing developmental changes. • Generally sound refinements of design ideas and a design solution that mostly meets the requirements of the design specification, informed by the mostly sound application of technical knowledge of materials and processes and the fully appropriate application of modelling/simulation techniques. • Chosen design idea shows mostly appropriate application of calculations to determine most material quantities and technical details of materials, processes and components that could be interpreted by a third party.
Level 4	10–12	<ul style="list-style-type: none"> • Fully appropriate use of research to inform ongoing developmental changes. • Fully sound refinements of design ideas and a design solution that fully meets the requirements of the design specification, informed by the fully sound application of technical knowledge of materials and processes and the effective application of modelling/simulation techniques. • Chosen design idea shows fully appropriate application of calculations to determine all material quantities and technical details of materials, processes and components that could be interpreted by a third party.

How this assessment grid differentiates student evidence of development.

Development evidence is differentiated in two ways.

- The quality of the additional research and how it is used to change and improve the chosen design idea.

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- The increasingly technical refinement of the chosen design idea into a developed chosen design that; meets the user/client needs; and a third party with subject knowledge could make.

Higher level development work will:

1. Feature recognisable improvements that link to the new research.
2. Provide sufficient technical information for making a prototype.
3. Provide full details of a final solution that attempts to meet all of the specification criteria listed for 1.2 (including any potential revisions of the specification that may appear later in the portfolio).
4. Use an appropriate selection of different communication techniques (as assessed for 2.4).
5. Use increasingly specific and technical language, and show specific and technical details relating to materials, processes, and techniques, including how they are applied to the developed design.
6. Conclude with a distinct final design that has significantly improved from the chosen idea.