OCR
Oxford Cambridge and RSA

GCSE (9–1)

NEA Marking Criteria
April 2017

DESIGN AND TECHNOLOGY

J310
For first teaching in 2017

GCSE Design and Technology Iterative Design Challenge (J310/02, 03) – Marking criteria

The marking criteria are set out over the following pages to outline how learners are to be assessed following completion of their own iterative design process that reflects their thinking, creative and practical skills and abilities through designing and making a prototype(s).

The marking criteria covers four mark bands to clearly differentiate learners' work and are delivered through five strands of assessment, rewarding two distinct considerations:

- the thinking and design **process** of the 'Iterative Design Challenge' through explore/create/evaluate is assessed in strands 1, 2 and 5

- the quality of design **outcomes** in relation to design communication and the final prototype(s) are assessed in strands 3 and 4.

The marking criteria follow a 'best-fit' approach as outlined in more detail in the specification. The layout of the assessment strands is to support internal application of the criteria, using the statements and marks at the bottom of each strand to support 'best-fit' allocation.

The marking criteria for the 'Iterative Design Challenge' should be considered together with the non-exam assessment content. Also use guidance on the delivery, required evidence for the 'Iterative Design Challenge' and the administrative requirements are set out in the specification.

Assessment of process

The three process strands (1, 2 and 5) of the marking criteria follow an iterative design process with strands that cover 'explore', 'create' and 'evaluate'. Effective management of the interrelationship between the strands of the iterative design process is also assessed within these strands.

The assessment of 'process' is the process that each individual learner has undertaken. The evidence of the process will be given through the learner's chronological e-portfolio.

Assessment of outcomes

The two outcome strands (3 and 4) of the marking criteria are an opportunity for assessment of the graphical and practical outcomes delivered throughout the learner's design processes. This is the assessor's judgement of:

- the quality of design communication
- the quality of the final prototype(s).

The assessment of 'outcomes' can only be made against what is evidenced in the learner's chronological e-portfolio.

Strand 1 – Explore (AO1)

	Mark Band 1 (1–5)	Mark Band 2 (6–10)	Mark Band 3 (11–15)	Mark Band 4 (16–20)
Investigations of the context	Superficial investigations indentify little or no problems and/or opportunities for further consideration.	Investigations are of sufficient quality to indentify some problems and/or opportunities for further consideration.	Investigations offer a good level of detail and indentify a breadth of problems and opportunities for further consideration.	Comprehensive investigations indentify a breadth of challenging problems and opportunities for further consideration.
Design brief	Limited relevance to the context and little or no identification of a primary user or other stakeholders.	Some relevance to the context and identification of a primary user and/or other stakeholders.	Mostly has relevance to the context offering scope for challenge and identification of a primary user and other stakeholders.	Clear and full relevance to the context offering scope for challenge and a focused identification of a primary user and other stakeholders.
Investigations of user and stakeholder needs and wants and the outlining of stakeholder requirements (non-technical specification)	Superficial consideration of primary user(s) needs and wants with little or no consideration of other stake-holders. Little or no requirements have been identified and are outlined with limited scope to support the future design process.	Some relevant consideration of primary user(s) needs and wants and some consideration of other stakeholders. Some requirements are identified that offer some scope to support the design process.	Informed consideration of primary user and other stakeholders needs and wants. A range of requirements with a good level of detail are identified that offer scope to support the design process.	Full and objective consideration of primary user and other stakeholders needs and wants. A range of comprehensive requirements are identified that offer scope to support the design process.
Investigations of existing products and design practices	Little or no information or sources of inspiration are identified to offer support to design iterations and thinking.	Some information and/or sources of inspiration are identified that may not always be relevant but do offer some influence on design iterations and thinking.	Good amount of relevant information and sources of inspiration are identified to influence design iterations and thinking when required throughout the design process.	Comprehensive and relevant information and sources of inspiration are identified to influence on design iterations and thinking when required throughout the design process.
Exploration of materials and possible technical requirements	Superficial consideration of materials and/or possible technical requirements.	Some relevant consideration of materials and possible technical requirements.	Informed consideration of materials and possible technical requirements when required throughout the design process.	Full and objective consideration of materials and possible technical requirements when required throughout the design process.
Technical specification	Inaccurate, outlines basic details and/or is incomplete making it difficult for a third party to understand.	Generally accurate, outlines details that communicate some requirements to a third party.	Good levels of accuracy, outlines details that communicate most requirements to a third party.	High levels of accuracy, outlines details that clearly communicate all requirements to a third party.
	1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20

0 marks – No response or no response worthy of credit.

Strand 2 – Create: Design Thinking (AO2)

	Mark Band 1 (1–6)	Mark Band 2 (7–12)	Mark Band 3 (13–18)	Mark Band 4 (19–24)
Generation of initial ideas	Limited use of different design approaches that lead to ideas that do not always reflect the requirements and may appear stereotypical.	Some different design approaches that lead to some ideas that avoid design fixation and generally reflect the requirements.	Different and relevant design approaches that lead to ideas that mostly avoid design fixation, offer scope for challenge and reflect requirements.	Different and relevant design approaches that lead to ideas that fully avoid design fixation, offer scope for challenge and fully reflect requirements.
Design developments	Limited developments are superficial and/or are not iterative.	Iterative developments are generally progressive and respond to some identified next-steps of development.	Iterative developments are progressive, incorporating technical requirements and respond to most identified next-steps of development.	Iterative developments are comprehensive and progressive, incorporating all technical requirements and fully respond to identified next-steps of development.
Development of final design solution(s)	Little or no progression seen from earlier developments and little or none of the identified opportunites and requirements have been met.	Some progression seen from earlier developments and some of the identified opportunities and requirements have been met.	Clear progression from earlier developments and most of the identified opportunities and requirements have been met.	Clear and comprehensive progression from earlier developments and all of the identified opportunities and requirements have been met.
Critical thinking	Superficial responses when problems are identified. Little or no evidence of innovation* throughout the design process.	Effective responses to some identified problems. Some evidence of innovation* throughout the design process.	Effective responses to most identified problems. Clear evidence of innovation* throughout the design process.	Systematic and effective responses to all identified problems. Clear and systematic evidence of innovation* throughout the design process.
	1 2 3 4 5 6	7 8 9 10 11 12	13 14 15 16 17 18	19 20 21 22 23 24

0 marks – No response or no response worthy of credit.

* Innovation in this context refers to learners considering new methods or ideas to improve and refine their design solutions and meet the needs of their intended market and/or primary user.

Strand 3 – Create: Design Communication (AO2)

	Mark Band 1 (1–4)	Mark Band 2 (5–8)	Mark Band 3 (9–12)	Mark Band 4 (13–16)
Quality of chronological progression	Design iterations are not always clear and/or chronological, with little or no support from real-time evidence.	Design iterations are sometimes clear and predominently chronological, some support from real-time evidence.	Design iterations are clear and chronological, mostly supported by real-time evidence.	Design iterations are systematic and chronological, fully supported by real-time evidence.
Quality of initial ideas	Informal graphical and modelling skills are limited and rarely clear enough to appropriately communicate initial thinking.	Informal graphical and modelling skills are sufficient, but are not consistent in appropriately communicating initial thinking.	Informal graphical and modelling skills are good and are consistent in appropriately communicating initial thinking.	Informal graphical and modelling skills are excellent and are effective and consistent in appropriately communicating initial thinking.
Quality of design developments	The range of communication techniques* used are limited and rarely clear enough to appropriately develop or communicate design concepts.	The range of communication techniques* used are sufficient, but are not consistent in appropriately developing or communicating design concepts.	The range of communication techniques* used are good and are consistent in appropriately developing or communicating design concepts.	The range of communication techniques* used are excellent and are effective and consistent in appropriately developing or communicating design concepts.
Quality of final design solution(s)	Formal presentation of the final design solution(s) is limited making it difficult for a third party to understand.	Formal presentation of the final design solution(s) is sufficient and provides some clarity to a third party.	Formal presentation of the final design solution(s) is good and provides appropriate clarity to a third party.	Formal presentation of the final design solution(s) is excellent and provides impact and appropriate clarity to a third party.
	1 2 3 4	5 6 7 8	9 10 11 12	13 14 15 16

0 marks – No response or no response worthy of credit.

* Refer to Strand 4 when assessing digital design and manufacture.

Strand 4 – Create: Final Prototype(s) (AO2)

	Mark Band 1 (1–5)	Mark Band 2 (6–10)	Mark Band 3 (11–15)	Mark Band 4 (16–20)
Quality of planning for making the final prototype(s)	Offers little or no support to the making process.	Generally supports the management of the making process with some relevant requirements identified from the technical specification.	Good level of detail and relevance, covering most requirements identified from the technical specification to manage the making process.	Comprehensive and relevant, covering all requirements identified from the technical specification to effectively manage the making process.
Quality of final prototype(s)	Inaccurate and/or basic standards demonstrated. Finishing may not be appropriate and/or the outcome would not present well to a stakeholder.	Sufficient standard demonstrated through a generally accurate outcome. Finishing is appropriate but the outcome could be better presented to stakeholders.	Good standard and levels of accuracy demonstrated. Finishing is appropriate and the outcome will present well to a stakeholder.	Excellent standard, demonstrating high levels of accuracy. Finishing is appropriate and the outcome will present well and provide impact to a stakeholder.
Use of specialist techniques and processes	Limited and rarely appropriate to materials/components being used.	Sufficient, but are not consistently appropriate to materials/components being used.	Good and are consistently appropriate to materials/components being used.	Excellent and are effective and consistently appropriate to materials/components being used.
Use of specialist tools and equipement	Use and selection of hand tools and/or machinery are limited and rarely appropriate. Digital design and/or manufacture* is limited and demonstrate little or no skills or knowledge.	Use and selection of hand tools and machinery are sufficient, but not always consistenly appropriate. Digital design and manufacture* is not always used appropriately, but demonstrate sufficient skills and knowledge.	Use and selection of hand tools and machinery are good and consistenly appropriate. Digital design and manufacture* are used appropriately to demonstrate good skills and knowledge.	Use and selection of hand tools and machinery are effective and consistently appropriate. Digital design and manufacture* are used effectively and appropriately to demonstrate excellent skills and knowledge.
Viability of the final prototype(s)	Little or no links to the technical specification and demonstrating limited potential to become a marketable product.	Meets some of the technical specification and demonstrating some potential to become a marketable product.	Meets most of the technical specification and demonstrating good potential to become a marketable product.	Meets all of the technical specification and demonstrating excellent potential to become a marketable product.
	1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20

0 marks – No response or no response worthy of credit.

*It may not have been appropriate to use digital design and manufacture in the final prototype. Where this is the case, the statement should be assessed on the skill levels demonstrated when using digital design and manufacture through earlier modelling. This can equally be applied to the use of hand tools and machinary, all of which require appropriate evidence.

Strand 5 – Evaluate (AO3)

	Mark Band 1 (1–5)	Mark Band 2 (6–10)	Mark Band 3 (11–15)	Mark Band 4 (16–20)
Analysis and evaluation of primary and/or secondary sources	Limited analysis and evaluation of investigated sources of information from stakeholders, existing products and/or wider issues, offering little or no support to inform the design process.	Sufficient analysis and evaluation of investigated sources of information from stakeholders, existing products and wider issues, offering some support to inform the design process.	Good level of analysis and evaluation of investigated sources of information from stakeholders, existing products and wider issues, offering clear support to inform the design process.	Comprehensive and systematic analysis and evaluation of investigated sources of information from stakeholders, existing products and wider issues, offering clear and focused support to inform the design process.
Ongoing evaluation to manage design progression	Superficial evaluations with little or no reflection on requirements or feedback. Little or no reviews to identify any problems and/or next-steps for future iterations resulting in limited support to design progression.	Some critical evaluations with sufficient reflection on requirements and feedback. Infrequent reviews to identify some problems and/or next-steps for future iterations that are not always consistent in supporting design progression.	Mostly critical evaluations with good reflection on requirements and feedback. Ongoing and clear reviews to identify problems and next-steps for future iterations to consistently support design progression.	Full and critical evaluations with focused reflection on requirements and feedback. Ongoing, clear and comprehensive reviews to identify problems and next-steps for future iterations to effectively and consistently support design progression.
Feasibility of the design solution	Limited with little or no methods used to appropriately analyse and test whether the design solution is fit for purpose.	Sufficient with some appropriate methods used to analyse and test whether the design solution is fit for purpose.	Good level of detail with mostly appropriate methods used to analyse and test whether the design solution is fit for purpose.	Comprehensive with fully appropriate methods used to analyse and test whether the design solution is fit for purpose.
Evaluation of the final prototype(s)	Superficial evaluation of strengths and/or weaknesses with little or no suggestions for modification and/or consideration of possible design optimisation presented.	Sufficient critical evaluation of strengths and/or weaknesses with some suggestions for modification and/or consideration of possible design optimisation presented.	Good critical evaluation of strengths and weaknesses with detailed suggestions for modification and consideration of possible design optimisation presented.	Full and critical evaluation of strengths and weaknesses with comprehensive suggestions for modification and consideration of possible design optimisation presented.
	1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20

0 marks – No response or no response worthy of credit.

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