DTBase©

Design & Technology
Eduqas GCSE

Making decisions

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. When you evaluate your prototype, your judgements should be based on:

A Evidence, not just opinion

B Your own opinion only

C What your friends like best

Q2. What should a prototype be tested against?

A The client's budget only

B Each specification point

C The colour chosen by the designer

Q3. A jar opener should open lids from 40 to 90 mm. In testing it opened 4 of 5 jars and slipped on the 90 mm lid. The specification point was:

A Met

B Not tested

C Partly met

Q4. Which of these is a way of gathering feedback from users?

A Rendering

B An exploded drawing

C A questionnaire

Q5. After suggesting and making modifications, what should you do next?

A Retest with users to check the changes have solved the problems

B Start a completely new design

C Send it straight to mass production

Q6. If a 3D printed prototype part was made in larger quantities, which process might replace 3D printing?

A Hand carving

B Injection moulding

C Laser engraving

Q7. A plain paper lampshade has been designed for a child's bedroom. Explain how the lampshade design could be improved to be used in a child's bedroom. **(2 marks)**

Q8. A child's puzzle is laser cut from a laminated wooden board and left unfinished. Explain, using an example, how the aesthetics of the puzzle can be improved. **(2 marks)**

Q9. Explain the purpose of using a focus group when developing a product. **(3 marks)**

Q10. Analyse how user testing benefits product development. **(4 marks)**

Q11. Explain the importance of evaluation when developing prototypes. Give specific examples in your answer. **(4 marks)**

Q12. Choose a product you know well, for example a prototype you have made. Name the product, then evaluate it against each specification point: function, quality, target market and materials. **(4 marks)**

Q13. A prototype toolbox is tested and evaluated during the process of designing and making. Evaluate the need for testing and evaluating. **(6 marks)**

Q14. A student has designed and made a concept model of a new handheld torch in blue modelling foam. The torch has an on/off switch, a handle, a lens and bulb compartment, and a main body that holds the batteries. Analyse the benefits that modelling will have for the eventual success of the new handheld torch. **(6 marks)**

Answers

Q1. A
Q2. B
Q3. C
Q4. C
Q5. A
Q6. B

Q7.

1 mark for a suitable suggestion to make the lampshade more suitable for a child's bedroom, and 1 mark for an explanation. For example: the lampshade could be dyed a bright, gender-neutral colour (1) to complement the colours of any bedroom, e.g. walls and furniture (1).

Other changes:

- A more interesting shape, such as a cuboid
- A printed pattern for aesthetic appeal
- Printed words or shapes for educational purposes
- A pattern cut into the paper to let out more light

Credit any other appropriate response.

Q8.

1 mark for a suitable answer and 1 mark for the explanation. For example:

- Painting (1) with acrylic paint changes the colour of the wood to attract the child's attention (1)
- Painting (1) the shapes in different colours would help children learn the names of the colours (1)
- The laser cut edges are burnt and need improving (1); changing the laser cutter settings would improve this (1)
- Replacing the material (1) with colourful acrylic would attract the user more and hold their attention for longer (1)

Other suitable finishes: varnish, wood stain, oils such as Danish oil (1).

Q9.

Marks	Descriptor
3	A detailed explanation, or several relevant points, showing understanding of the purpose of using a focus group when developing a product.
2	A basic explanation showing understanding of the purpose of using a focus group.
1	A simple correct statement showing what a focus group is, but not its purpose.
0	No response or nothing worthy of credit.

Indicative content:

- A group of people, users or customers gathered together to give feedback on a product
- Getting people's opinions on a product or prototype before it is launched
- Watching or observing a group of people and how they interact with a product (often by recording them)
- To gain insight into the experiences and views of different users

Q10.

Up to 4 marks for identifying and discussing the benefits and/or disadvantages of user testing for product development. A maximum of 2 marks for just identifying benefits or disadvantages without discussion. Disadvantages, such as the time user trials take and the extra cost, can be credited. For example:

- User testing helps foresee problems early in product development (1), which can help the final product succeed in the marketplace (1)
- Feedback can suggest how a product could be improved (1), helping the designer make changes promptly so the product suits its intended users (1)
- User trials can suggest modifications later in a product's life cycle (1) that bring it back into the marketplace (incremental development) (1)
- Disadvantage: the information gathered may be contradictory, making decisions difficult for the designer (1)
- Disadvantage: the time taken to gather feedback delays production (1), missing out on sales (1), and increases the retail cost (1), which could price the product out of the market (1)

Q11. (4 marks)

Marks	Descriptor
3 to 4	An excellent explanation of why designers use evaluation to develop prototypes, with example(s). Examples are needed for full marks.
1 to 2	A basic understanding of why designers use evaluation when developing prototypes. Examples are not needed for 2 marks.
0	No response or nothing worthy of credit.

The question is about why we test, not how. Indicative content:

- Identify what is working well and what needs improving
- Promote improved quality in the design
- Make sure prototypes are suitable for their intended user(s)
- Review tests against both the design specification and the manufacturing specification
- Evaluate the materials to be used and check their suitability, cost and function for their intended use
- The opinions of customers and end users need to be evaluated before prototypes become commercial products

Q12.

1 mark for each appropriate evaluative point for the chosen product, up to 4 marks:

- Function: the point should relate to how the product works
- Quality: the point should relate to the quality of manufacture or finish, or how suitable the material used is
- Target market: the point should relate to who the product is aimed at (a suitable choice of target market)
- Materials: the point should relate to suitable characteristics and properties for the product's use

Credit any other appropriate response.

Q13. (6 marks)

Testing and evaluating a prototype during designing and making makes sure the toolbox:

- Meets the design specification criteria written by the designer
- Meets the demands of the manufacturing specification
- Is made with quality throughout
- Fits the target market as expected, and meets their demands at that time
- Withstands daily wear and tear, e.g. the panels can withstand use
- Can hold the weight of the tools stored in it
- Is durable and hard wearing because of its construction and finish
- Has suitable dimensions and construction methods
- Can be changed before manufacture

Band	Marks	Descriptor
3	5 to 6	A coherent answer with detailed, relevant knowledge and understanding of the usefulness of testing and evaluating a prototype in designing and making. Relevant examples and well-developed, substantiated judgements in a logically structured response.
2	3 to 4	Some coherence, with partial knowledge and understanding of the usefulness of testing and evaluating a prototype. Mostly relevant examples and partly substantiated judgements in a generally well structured response.
1	1 to 2	Basic knowledge and understanding of the usefulness of testing and evaluating a prototype. Limited relevant examples or judgements, with little structure.
0	0	Incorrect or irrelevant answers.

Q14. (6 marks)

Guidance:

- Ideas can be fully tested before production, saving time and money and reducing errors
- Modifications and changes can be identified and made as a result of modelling
- Models can be tested by the target market and analysed to improve the next iteration

- Modelling allows the shape, form, aesthetics and ergonomics to be fully developed
- The designer can “feel” how the idea would work: a real-life test, not a simulation
- Materials, components, sizes and costs can be estimated from the model
- The model could be scanned into CAD to generate CAM files for production

Marks	Descriptor
5 to 6	A clear and detailed analysis, e.g. modelling allows testing of the torch by the designer and the target market so good features can be kept and changes identified to improve it. This makes sure the final product is successful and meets all the market’s needs and wants, and stops it being manufactured with defects or problems, which would be costly for the manufacturer.
3 to 4	Some detail and understanding, e.g. modelling allows testing of the torch so good features can be kept and changes identified to improve it; the model stops the product being manufactured with defects or problems.
1 to 2	A brief description with very little analysis, e.g. modelling helps the designer see if it is a good idea, or the product can be tested to see if it works well or needs to change.
0	No answer or no relevant information.