DTBase©

Design & Technology
Eduqas GCSE

Writing a design brief and specifications

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 a design brief?

A A detailed list of measurable requirements

B A short statement of the problem to be solved and what needs to be designed

C A drawing showing the final dimensions

Q2. When is the design brief usually written?

A After investigating the context and users

B After the final prototype is made

C Before the context has been chosen

Q3. Which of these is a constraint in a design brief?

A The colour the user likes best

B The name of the product

C A limit such as size, budget, time or materials

Q4. Which is the best specification point?

A It must be comfortable

B The handle must be 30 to 35 mm in diameter to fit the 5th to 95th percentile hand grip

C It must look nice

Q5. Why should each specification point be justified?

A To make the specification longer

B So the client does not need to read it

C To show why it is needed, linked to your research

Q6. What is the specification later used for?

A To evaluate design ideas and the final prototype

B To choose the context

C To replace the design brief

Q7. An electric cargo bike has a box at the front for carrying two young children. Write a design brief for the electric cargo bike that reflects its function. **(2 marks)**

Q8. Give five detailed specification points to help with the designing of a toy for use by a child between 3 and 5 years of age. **(5 marks)**

Q9. A farmer's family leave their muddy boots outside the door of the farm house. A storage unit is needed for eight pairs of boots, to be placed outside the farm house, with a method of removing excess amounts of mud. List four additional points about the function of such a storage unit that you consider to be important. **(4 marks)**

Q10. A device is needed for transporting a small household pet. The device should allow the pet to remain safe while being transported for a short time. List four additional points about the function of such a device that you consider to be important. **(4 marks)**

Q11. Choose one of these products: a mountain bike; a sports vest; a skateboard; an egg box; a sports watch; a plastic shoe. Evaluate your chosen product against each of these specification points: function; quality; target market; material. **(4 marks)**

Q12. Playground equipment is brightly coloured and has a play house, steps, climbing features and a slide. Its specification is: for use by children aged 4 to 12; designed for external use; recessed or flush fitting construction fittings; all fittings are tamper proof; weatherproof materials; suitable for installing on a flat surface; non-slip surfaces; tough, durable and wear resistant finish on all parts; parts designed to be bolted together. Analyse and evaluate the playground equipment in terms of suitability for the user. **(4 marks)**

Q13. A GPS sports watch is worn by adult runners to monitor activity and aid training. Its specification is: lightweight; waterproof (face and strap); rechargeable battery; battery lasts up to 3 weeks (10 hours in GPS mode); features include time, date, calendar, alarm, touchscreen and GPS for recording sporting data.

Q13a. You have been asked to redesign the watch for a child aged between 9 and 11 years old. To make the watch more appealing to children it should allow for activities other than running. Give four changes or additions to the original design specification and explain how each would make the watch suitable for the new target market. Do not refer to the colour of the watch in your answer. **(8 marks)**

Q13b. Explain why having a design specification is important to designers and how this helps to ensure a successful outcome. **(3 marks)**

Answers

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

Q7.

The brief must be a clear statement of intent, not a list of specification points, and the function of the cargo bike must be clear. 1 mark for the intent (design and make) and 1 mark for the function. For example:

- Design and make (1) a bike that can carry two children (1)
- Design and make (1) a bike that is safe for children to be transported in (1)
- Design and make (1) a bike powered by electricity to make carrying the weight of children easier (1)

Q8.

1 mark for each detailed specification point suitable for a toy for 3 to 5 year old children (up to 5). For example:

- It must amuse or entertain the child
- Bright and colourful to engage the child's interest
- It must not contain any small parts that could easily be swallowed
- There should be no sharp edges that could cut the child
- There should be no pointed pieces that could puncture the skin
- Any finish (paint) must not be toxic or harmful if chewed or swallowed
- Any battery must be secured so the child cannot remove it
- There must be no gaps where a child could trap a finger
- Tough, durable materials so it does not break if dropped or thrown
- Easy to clean, because the child may chew it or drop food on it

Vague points get no marks, e.g. "It must be strong", "It must not be too big", "It must be made from cheap materials".

Q9.

1 mark for each additional specification point (up to 4). Do not accept repeats of the question (holds eight pairs of boots; placed outside; removes mud; protects from the weather). For example: easy to clean; boots easily accessible; easy to move; robust; fits different sizes of boot; resists damage from dirt and water; lets mud and water be collected; base resistant to muddy ground; includes other features such as a seat or other storage; fits in with the environment.

Q10.

1 mark for each additional specification point (up to 4). Do not accept repeats of the question (transports a small pet, keeps it safe, used for a short time), or one-word general answers such as “safe” or “nice”. For example: air holes so the pet can breathe; a soft surface to sit on; an easy to clean interior; easy to carry, e.g. handles; the door must secure closed; easy to get the pet in and out. One-word answers are only accepted if relevant to this problem, e.g. lightweight, hygienic, durable, lockable, weatherproof, compact.

Q11.

1 mark for each appropriate evaluation point for the chosen product (up to 4):

- Function: relates to how the product works
- Quality: relates to the quality of manufacture or finish, or how appropriate the material is
- Target market: relates to who the product is aimed at
- Material: relates to suitable characteristics and properties for the product’s use

Q12. (4 marks)

Answers may consider both positive and negative points.

Marks	Descriptor
3 to 4	A well described and justified analysis with full evaluation, drawing conclusions after considering a range of factors.
1 to 2	Brief points that are not fully explained. Analysis present but limited evaluation or conclusions.
0	No attempt or nothing worthy of credit.

Indicative content:

- Bright colours are engaging and encourage children to interact
- The house feature may encourage children to play together
- Lots of different things to do, developing co-ordination and physical activity
- Recessed fixings mean children do not catch or hurt themselves
- A tough, durable finish keeps the equipment looking good for longer, attracting children
- Designed for a specific age range, so children can climb, use and fit on it, e.g. step spacing, not too far to fall at the bottom of the slide
- Not suitable for over 12s or under 4s
- Only suited to daytime use as it is outside, unless there is artificial light

Q13a.

1 mark for each change or addition to the specification, plus 1 mark for explaining why it is important (up to 4 × 2 marks). For example:

- It must be smaller so it fits the wrist of a 9 to 11 year old and is not too bulky
- Simple to operate, with simple features that children can easily access
- Cyber safety features so the child is not put at risk by using it
- Interesting and engaging, e.g. logos or images on the strap, to encourage children to use it
- A tracking feature so parents can see where their children are
- Mini-games to entertain children
- A greater range of strap adjustment, because children grow a lot between 9 and 11

Q13b.

Marks	Descriptor
3	Clear understanding of the use of a design specification, including clear reference to its use in evaluation and how this helps ensure a successful outcome.
2	Some understanding of what a design specification is, with some reference to evaluating the final product and how this affects success.
1	Basic understanding of the use of a design specification, with no reference to evaluating the final outcome.
0	Nothing worthy of credit.

A design specification is important because it:

- Lets the designer summarise their research
- Gives clear criteria to work from
- Gives a point of agreement between the designer and the client
- Gives the designer a clear focus on what they want to achieve

It helps ensure a successful outcome because it:

- Lets the designer modify their design as part of the iterative design process
- Gives criteria to test each version (iteration) of the prototype against
- Lets the designer evaluate the success of the final outcome