DTBase©

Design & Technology
Eduqas GCSE

Understanding design and technology practice

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 context in design and technology?

- **A** A detailed list of requirements a product must meet
- **B** The situation or setting in which a design problem exists
- **C** A drawing that shows how a product is assembled

Q2. Which of these is a context rather than a design problem?

- **A** An ageing population
- **B** Opening jars with arthritis
- **C** Remembering to take medication

Q3. What is the difference between the end user and the client?

- **A** They are always the same person
- **B** The client uses the product; the end user pays for it
- **C** The end user uses the product; the client asks for it to be designed

Q4. A walking stick must support the weight of the user. This is an example of:

- **A** A need
- **B** A want
- **C** A context

Q5. What is usually the first step when using a context as a starting point?

- **A** Write the design brief
- **B** Suggest design problems
- **C** Explore the context, e.g. with a mind map

Q6. Which of these is a want rather than a need for a walking stick?

A It supports the weight of the user

B It folds up and comes in a choice of colours

C It does not slip on the floor

Q7. The ‘power & play’ product is a blue travel pack with these features: a 4000 mAh power bank with an LED display and torch feature; a 3-in-1 charging cable that fits Apple Lightning, Apple 30-pin and micro USB connections; earbud style in-ear headphones with an in-line microphone.

Q7a. Explain why this product has been developed. **(2 marks)**

Q7b. Describe the target market that the ‘power & play’ product was designed for. **(2 marks)**

Q8. Choose one of these camping products: a cotton towel; paper plates, bowls and cups; plastic cutlery; a metal folding chair; an LED portable lamp; a timber picnic bench. Describe how your chosen product is suitable for use when camping. **(2 marks)**

Q9. A company sells kit products that the user builds themselves: a fabric sew kit, a cardboard build kit, a plastic build kit, a metal build kit, a radio systems build kit and a timber build kit. Choose one of these kit products.

Q9a. State a suitable target market for your chosen kit product. **(1 mark)**

Q9b. Describe two problems the target market in Q9a could have when constructing and using the kit product chosen. **(4 marks)**

Q10. When designing a product, the needs and views of the primary users and wider stakeholders are considered.

Q10a. A range of toys is designed for children under 10 years old. When the primary user is a young child, identify two stakeholders that should also be considered when designing the toys. **(2 marks)**

Q10b. An electric scooter is designed for people to ride in towns and cities. Identify two wider stakeholders the designer of the scooter will need to consider. **(2 marks)**

Q11. Vacuum cleaners have changed considerably over time. Modern types include the suction bag vacuum cleaner, the cyclonic (bagless) vacuum cleaner, the hand held vacuum cleaner and the robot vacuum cleaner. Analyse and evaluate how modern vacuum cleaners meet the needs and wants of users. **(4 marks)**

Q12. Bus stops are found on roadsides in towns and cities. Analyse and evaluate how the design of a bus stop can meet user needs and wants. **(4 marks)**

Q13. An exercise bike for use at home has this specification: a variety of exercise programmes; internet ready; robust design; customer care support; ergonomic design; safety features. Evaluate the exercise bike in terms of satisfying the needs and wants of the user. **(4 marks)**

Q14. Two school bags are designed for children. The rucksack specification is: lightweight; waterproof; high visibility; adjustable straps; carrying handle; compartments. The drawstring bag specification is: lightweight; compact design; large single storage space; simple construction; waterproof. Analyse and evaluate both products in terms of their suitability for the user. **(6 marks)**

Answers

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

Q7a.

Up to 2 marks for describing the design context or need for the product.

- 1 mark for a basic response, e.g. so people can charge their phones if they run out of power, or to have a back up in case they run out of power
- 2 marks for a more detailed response, e.g. so owners of portable handheld electronic products have a way of recharging them 'on the go', away from mains power

Q7b.

Up to 2 marks. The answer should describe typical users: age, gender, interests, hobbies or lifestyle. For example: holiday makers, people who travel a lot, commuters, students who travel on public transport and have several devices to charge.

- 1 mark for a basic response, e.g. users who are sporty and spend lots of time outdoors, or young people aged 10+ who use tablets and phones
- 2 marks for a more detailed response, e.g. people who take part in sports or outdoor events for long periods and need to recharge their electronic products when they cannot connect to the mains

Q8.

1 mark for a suitable function or reason, plus 1 mark for a clear description. For example: paper plates are disposable (1), so there is less to carry and store (1). Other examples:

- Cotton towel: absorbent so dries the body quickly; covers the body; can be lain on
- Paper plates, bowls and cups: hold food safely; disposable; stack easily for travelling and picnics; cheap and easy to find

- Plastic cutlery: disposable; cheap; safe for children as it is not sharp; easy to clean; portable
- Metal folding chair: comfortable to sit on outdoors; folds so it is easy to carry and store; can be wiped clean if it gets wet
- LED portable lamp: gives safe light inside a tent at night; economical to run; compact and easy to carry and store
- Timber picnic bench: big enough for the whole family to sit around; robust and heavy so it is safe; can be used to prepare food or play games

Q9a.

One mark for a suitable target market, e.g. children, teenagers, adults. Accept answers specific to the kit chosen, e.g. knitters, people interested in crafts, model makers. Note: none of the kits are suitable for very young children (e.g. under 3), as small parts are a choking hazard and fine motor skills are needed.

Q9b.

1 mark for each problem identified (up to 2), plus 1 mark for a clear description of each. Answers must relate to the kit chosen. For example:

- Parts are easily lost or need replacing; replacement parts are hard to find and cost more
- Frustration if the build is unsuccessful or too difficult
- The instructions may not be clear, so the user may give up
- Boredom: once the kit is made, the challenge is over
- Once built, the kit cannot be developed or changed (not for metal or plastic kits)
- The kit costs far more than its component parts
- Some parts are not finished and could cause harm
- Danger, e.g. sewing needles are sharp; small parts are a choking hazard
- Sustainability: once built, the kit may be thrown away and the parts may not be easy to recycle

Q10a.

Any two (1 mark each): parents or adult carers of children; schools or playgroups the children attend; Health and Safety Executive; retailer; manufacturer. Do not accept children, siblings or teenagers.

Q10b.

Any two (1 mark each): local council or government; police; other road users or car owners; pedestrians; shop owners or retailers; the manufacturer of the scooter. Do not accept the primary user (the rider): the question asks for wider stakeholders.

Q11. (4 marks)

Marks	Descriptor
3 to 4	A detailed analysis and evaluation of the needs and wants of vacuum cleaner users. More than simple general statements.
1 to 2	Simple statement(s) of user needs or wants.
0	No response or nothing worthy of credit.

A list of features that are not explained or linked to the user (e.g. keeps the house clean, sucks up dirt, easy to store) gets a maximum of 2 marks.

Example 4 mark answer: the vacuum cleaner needs to let the user keep their home clean as efficiently as possible. They want one that needs as little effort as possible to use, as the user could be an older person. It needs to move into tight and awkward spaces so no dirt is missed. The user will want to know when it is full and be able to empty it without making extra mess.

Example 2 mark answer: the vacuum cleaner needs to suck up dirt to keep the user's home clean and tidy.

Q12. (4 marks)

Marks	Descriptor
3 to 4	A detailed analysis and evaluation of user needs and/or wants, clearly linked to features of the bus stop.
1 to 2	A basic analysis and evaluation of user needs and/or wants, with simple points linked to the bus stop.
0	No response or nothing worthy of credit.

Indicative content:

- Clearly shows the bus driver where to stop
- Clearly shows bus times so users can plan journeys and arrive on time
- Somewhere to keep dry in poor weather
- Well lit, in a safe and visible place, for the safety and security of the user
- Bollards to protect people waiting from other vehicles
- Enough space for several people to stand or sit without invading personal space
- Somewhere to sit if waiting a long time
- Audible announcements of bus arrival times and travel updates
- Positioned away from the road so users are not splashed by passing vehicles

Q13. (4 marks)

Marks	Descriptor
3 to 4	A detailed evaluation of how the exercise bike satisfies the needs and wants of the user.
1 to 2	A basic analysis of how the exercise bike satisfies the needs and wants of the user, with little or no evaluation.
0	No response or nothing worthy of credit.

Indicative content:

- Safety: a stable design with rubber feet that cannot slip on the floor
- Improves physical fitness and wellbeing
- A variety of training options (e.g. mountain mode, sprint mode) stops the user getting bored
- Adjustable seat and handlebars for comfort
- Internet ready, so the user can work with a real personal trainer or exercise online
- The user can exercise safely at home
- Easy to assemble after purchase, and to fold or take apart for storage

Q14. (6 marks)

Marks	Descriptor
5 to 6	A thorough analysis and evaluation of both bags, considering their suitability for children to use.
3 to 4	Good analysis and simple evaluative points about one or both bags, considering their suitability for children to use.
1 to 2	Basic analysis of one or two simple suitability points for either bag.
0	No response or nothing worthy of credit.

Expect answers to consider the needs (essential things) and wants (desirable things) of a child or teenager.

Rucksack

- Somewhere to carry a drinks bottle, so it does not get lost
- Lots of pockets for a phone, pencil case and calculator, so things are kept safe and organised
- Zips and clips so items do not fall out and get lost
- Adjustable, padded straps for comfort when carrying the bag for a long time
- Hard-wearing material so holes do not appear when dragged on rough surfaces, e.g. the playground
- Keeps contents dry and protects fragile things from being crushed
- Colourful graphics appeal to the user; reflector triangles for safety
- Can be carried by the handle or the straps; but it may be expensive

Drawstring bag

- Easy to customise, e.g. writing a name on it, adding badges, stickers and keychains
- Folds away when not in use; expands to fit more in, as there are no compartments
- The string might fall out so the bag cannot be closed
- Thin material, so a hole might wear in it easily
- Hard to find things when the bag is full
- Keeps contents dry; but the strings may be uncomfortable to carry