

Design & Technology

AQA GCSE

Properties of materials

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. Why is lightweight property important for corrugated cardboard packaging?

- A** To make it more colourful
- B** To avoid adding significant weight to the package
- C** To increase its thermal insulation

Q2. High carbon steel is used in screwdrivers primarily because it is:

- A** Hard and durable
- B** Cheap to produce
- C** Highly flexible

Q3. Why is breathability important for gym wear?

- A** To make it waterproof
- B** To reduce fabric weight
- C** To enhance comfort during exercise

Q4. What is the primary function of liquid crystals in displays?

- A** To generate sound
- B** To emit or block light electronically
- C** To increase screen weight

Q5. The table below shows a range of products

		
Mail packaging	Baseball bat	Screwdriver blade
		
Babys drinking cup	Gym wear	Electronic device with display

Q5a. Name the specific main material/component of your chosen product (1 mark)

Q5b. Name one property of the material of your chosen product (1 mark)

Q5c. Describe why the property is needed for the product to function properly (2 marks)

Answers

Q1. B

Q2. A

Q3. C

Q4. B

Q5.

Product	Specific main material	Property of the material	Why is the property needed for the product to function properly?
Mail packaging	<ul style="list-style-type: none">• Corrugated cardboard	<ul style="list-style-type: none">• Lightweight• Impact resistance• Thermal protection	<ul style="list-style-type: none">• Does not add to package weight significantly.• Protection against penetration
Baseball bat	<ul style="list-style-type: none">• Ash• Hickory	<ul style="list-style-type: none">• Tough• Durable• Springy wood	<ul style="list-style-type: none">• Prevents excessive marking due to ball impact.
Screwdriver blade	<ul style="list-style-type: none">• Steel• Chrome vanadium steel• High carbon steel	<ul style="list-style-type: none">• Hardness• Durability	<ul style="list-style-type: none">• Ability to turn a screw head without stripping screwdriver tip.
Baby's drinking cup	<ul style="list-style-type: none">• Polypropylene• Polycarbonate• Melamine	<ul style="list-style-type: none">• Heat resistant• Moisture resistant• Soft touch polymer	<ul style="list-style-type: none">• Dishwasher safe.• Non-reactive – does not taint food.• Resist knocks and impacts.

			<ul style="list-style-type: none"> • Scratch resistant. • Soft so not hard on baby's gums.
Gym wear	<ul style="list-style-type: none"> • Cotton • Nylon • Nylon microfibre • Polyester • Polyester microfibre • Knitted fabric 	<ul style="list-style-type: none"> • Breathable • Lightweight • Wear resistant • Durability • Flexibility • Washable 	<ul style="list-style-type: none"> • Comfortable to wear – hugs the body. • Improved long term performance after washing. • Stretchy, dries quickly (not for cotton), crease resist (not for cotton).
Electronic device with display	<ul style="list-style-type: none"> • Liquid Crystal Display (LCD) or Light-emitting Diode (LED) 	<ul style="list-style-type: none"> • Conductivity 	<ul style="list-style-type: none"> • Liquid crystals respond electronically to emit light.