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Design & Technology
AQA GCSE

How to shape and form using cutting, abrasion and addition

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. Planing timber is primarily used to:

A Remove bark

B Create smooth, flat surfaces

C Bend the wood

Q2. Brazing differs from soldering because it:

A Uses lower temperatures

B Doesn’t require flux

C Uses filler metals with higher melting points

Q3. Vacuum forming is suitable for:

A Thermoplastics

B Thermosetting plastics

C Elastomer plastics

Q4. Quilting involves:

A Weaving threads

B Stitching layers together with padding

C Printing patterns

Q5. Select one of the following material categories and processing techniques

Papers & Boards	Timber	Metals	Polymers	Textiles	Electronics
Creasing	Planning	Brazing	Vacuum Forming	Quilting	Soldering PCB Components

Q5a. What is the purpose of one key processing technique for this material? **(1 mark)**

Q5b. Describe how to perform this technique safely/effectively **(2 marks)**

Q5c. Give an example of a product where this technique is used **(1 mark)**

Answers

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

Option 1: Papers and Boards
Technique: Creasing

1. **Purpose:** Allows neat folding without cracking surface layers. *(1 mark)*
2. **Process:**
    - Use a blunt blade/creasing tool to compress fibers along fold line. *(1 mark)*
    - Apply even pressure to create a weakened fold line. *(1 mark)*
3. **Example:** Greeting cards. *(1 mark)*

Option 2: Timber-Based Materials
Technique: Planing

1. **Purpose:** Creates smooth, flat surfaces. *(1 mark)*
2. **Process:**
    - Secure timber in a vice/workbench. *(1 mark)*
    - Push plane along grain, adjusting depth for thin shavings. *(1 mark)*
3. **Example:** Wooden table tops. *(1 mark)*

Option 3: Metal-Based Materials
Technique: Brazing

1. **Purpose:** Joins metals stronger than soldering. *(1 mark)*
2. **Process:**
    - Clean metals, apply flux, heat to 450°C+ until filler melts. *(1 mark)*
    - Capillary action draws filler into joint. *(1 mark)*
3. **Example:** Bicycle frames. *(1 mark)*

Option 4: Polymers
Technique: Vacuum Forming

1. **Purpose:** Shapes thermoplastic sheets. *(1 mark)*
2. **Process:**
    - Heat plastic until pliable, drape over mold. *(1 mark)*
    - Apply vacuum to suck air out, forming shape. *(1 mark)*
3. **Example:** Plastic packaging trays. *(1 mark)*

Option 5: Textile-Based Materials

Technique: Quilting

1. **Purpose:** Insulates/decorates with stitched layers. *(1 mark)*
2. **Process:**
    - Sandwich wadding between fabric layers. *(1 mark)*
    - Stitch through all layers in patterns. *(1 mark)*
3. **Example:** Winter jackets. *(1 mark)*

Option 6: Electronic/Mechanical Systems

Technique: Soldering PCB Components

1. **Purpose:** Secures electrical connections. *(1 mark)*
2. **Process:**
    - Heat joint with iron, apply solder until molten. *(1 mark)*
    - Allow to cool without movement for smooth fillet. *(1 mark)*
3. **Example:** LED circuit boards. *(1 mark)*