**Design & Technology**

**AQA GCSE** Logo

Description automatically generated with low confidence

**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)*