

Design & Technology AQA GCSE

Cut materials efficiently and minimise waste

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 it important to plan how materials are cut before starting production?

- A** To make the product look more complicated
- B** To minimise waste and reduce material cost
- C** To avoid using colour

Q2. What is the method of arranging shapes closely together to reduce offcuts called?

- A** Stacking
- B** Nesting
- C** Doubling

Q3. Why might extra material be added around the edge of fabric parts during planning?

- A** To allow for printing
- B** To create a textured effect
- C** To allow for seam allowance or joining

Q4. How can technology help reduce waste during cutting?

- A** By randomly placing parts on the material
- B** By using CAD software to arrange shapes precisely
- C** By guessing the best layout

Q5. During manufacture it is important to use materials efficiently and minimise waste. Explain how each of the following improves material management. **(2 x 3 marks)**

Nesting of shapes and parts/lay planning

Cutting techniques

Answers

Q1. B

Q2. B

Q3. C

Q4. B

Q5.

Nesting of shapes and parts/lay planning

- A process for planning and working out the best way to maximise the effective use of material and minimising waste as much as possible.
- By placing similar shapes and parts next to each other to minimise waste.
- Strategic way of planning material use and minimising waste.
- Looking for patterns in nesting eg inverting shapes being cut out if they are triangular to save material by placing parts as close together as possible.
- Tessellation is a process by which parts are placed together in interlocking and repeating patterns to minimise waste.
- Consideration of standard forms and sizes of available material to ensure materials are sourced in the most cost-efficient form to minimise waste.

Cutting techniques

- Allow for the width of saw cuts eg 2mm with a dovetail saw to ensure the process of cutting does not accidentally reduce the size of material being cut out.
- Failure to consider material removed by saw cuts will make shapes/parts being cut out possible too small (out of tolerance) and having to be rejected ie material wasted.
- Seam allowance to allow for an effective join to be formed along the edges of fabric materials to be joined.
- Use of different coloured lines for cut and score/crease lines in paper and boards to ensure fold flaps and glue flaps are created to ensure effective assembly.
- Use of red line for cut and black lines for engrave/raster lines on a laser cutter to avoid errors in pre-cut checks. Accept other responses.