Design Technology Assessment: Textile Innovations

Learning objective: To evaluate understanding of textile properties, functional design, and construction techniques in accordance with Year 5 Design Technology standards.

Read each question carefully. Use your knowledge of fabrics and construction to provide detailed, scientific answers. Ensure your justifications are clear and use technical vocabulary where appropriate.

Max the monkey is designing a new lightweight backpack to carry his collection of maths puzzles. He is deciding between using a woven cotton fabric or a synthetic nylon material. He needs the bag to be strong enough to carry heavy books but light enough to take on long expeditions. Ellie the elephant suggests that he must also consider how he will join the pieces together to ensure the bag does not tear under pressure.

Word bank: durability · tensile strength · seam allowance · synthetic · natural fibres · template · fastening · aesthetic · functional · sustainability

1. Identify one natural fibre and one synthetic fibre. Explain one significant difference in how these fibres are produced. (2 marks)

2. Max is choosing between cotton and nylon for his backpack. Justify which material would be more suitable if he intends to use the bag in wet weather conditions. (2 marks)

3. Explain why a 'seam allowance' is a critical measurement when cutting fabric pieces for a 3D product. (2 marks)

4. List three different types of fastenings that could be used on a backpack and describe the specific function of each. (3 marks)

5. Compare and contrast the importance of the 'aesthetic' design of a product versus its 'functional' design. Which do you believe is more important for a piece of clothing or equipment? Justify your answer. (4 marks)

6. Describe the process of creating a fabric product from a 2D template to a 3D finished item. Include why pinning and tacking are necessary stages. (4 marks)

7. Extended Response: Max wants his backpack to be environmentally friendly. Propose a design plan that incorporates the concept of 'sustainability'. Consider material sourcing, product longevity, and potential for repair. How might these choices affect the overall cost of production if the bags were sold for £15.00 each? (5 marks)

Draw: In the space below, sketch a design for a new, innovative fastening system for Max’s backpack. Label your diagram with the materials used and explain why your design is more efficient than a standard zip.

Extension challenge: What might happen if a designer chose a fabric with poor tensile strength for a rucksack intended for heavy-duty use? Propose an experiment to test the strength of three different fabric scraps and explain how you would ensure your results are fair and accurate. Total: /25