



## General Certificate of Education

# Design and Technology: Product Design 5551/6551

### *PD1T Materials and Components*

## Mark Scheme

### *2006 examination - January series*

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

# Design and Technology: Product Design

## Textiles Design Unit 1 (PD1T)

### *Quality of Written Communication*

The following marks are allocated to the quality of the candidate's written communication. Make a separate assessment of the candidate's overall ability as demonstrated across the paper using the criteria given below.

<i>Performance Criteria</i>	Marks
The candidate will express complex ideas extremely clearly and fluently. Sentences and paragraphs will follow on from one another smoothly and logically. Arguments will be consistently relevant and well structured. There will be few, if any, errors of grammar, punctuation and spelling.	4
The candidate will express moderately complex ideas clearly and reasonably fluently, through well-linked sentences and paragraphs. Arguments will be generally relevant and well structured. There may be occasional errors of grammar, punctuation and spelling.	3
The candidate will express straightforward ideas clearly, if not always fluently. Sentences and paragraphs may not always be well connected. Arguments may sometimes stray from the point or be weakly presented. There may be some errors of grammar, punctuation and spelling, but not such as to suggest a weakness in these areas.	2
The candidate will express simple ideas clearly, but may be imprecise and awkward in dealing with complex or subtle concepts. Arguments may be of doubtful relevance or obscurely presented. Errors in grammar, punctuation and spelling may be noticeable and intrusive, suggesting weaknesses in these areas.	1

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This mark scheme is intended as a guide to the type of answer expected but is not intended to be exhaustive or prescriptive. If candidates offer other answers which are equally valid **they must be given full credit**.

Many responses at this level are assessed according to the **quality** of the work rather than the number of points included. The following level descriptors are intended to be a guide when assessing the quality of a candidate's response.

<b>(low mark range)</b>
The candidate has a basic but possibly confused grasp of the issues. Few correct examples are given to illustrate points made. Description may be unclear.
<b>(mid mark range)</b>
The candidate has some knowledge but there will be less clarity of understanding. Some correct examples given to illustrate points made. Description better but unclear or confused in parts.
<b>(high mark range)</b>
The candidate has a thorough understanding of the issues and has provided relevant examples to support the knowledge shown. This candidate's answer shows clear evidence of understanding.

*Question 1*

- (a) (i) Candidate may respond through an annotated diagram and/or written description.  
Twill weave (1 mark), white weft (1 mark), coloured warp (1 mark), usually cotton (1 mark), diagonal lines on face (1 mark),  
Reference to interlacing pattern of warp and weft (1 mark).  
**Any 4 points, 1 mark each** (4 marks)
- (ii) Reference should be made to fibre content and fabric structure,  
e.g. washable, hardwearing, resistant to abrasion, aesthetically pleasing.

**Marks awarded as follows:**

Little understanding, simplistic statements only, candidate typically concentrates on limited fibre qualities without reference to structure of the fabric or intended use.

(1 – 2 marks)

Candidate shows understanding of the contribution made by at least one aspect of the fabric structure but most points will relate to fibre content. There will be a sound attempt to analyse appropriateness of fabric for jeans.

(3 – 4 marks)

Candidate shows sophisticated understanding of the contribution made by several aspects of the fabric structure and fibre content in relation to jeans.

(5 – 6 marks) (6 marks)

- (b) (i) Candidate may respond through an annotated diagram and/or written description.  
Pile weave (1 mark), cut pile (1 mark), use of extra warp (1 mark), plain weave ground (1 mark), reference to weave pattern (1 mark).  
**Any 3 points, 1 mark each** (3 marks)
- (ii) e.g. cotton, polyester cotton, nylon, viscose, silk polyester, other appropriate blend. (1 mark)
- (c) (i) Candidate may respond through an annotated diagram and/or written description.  
Satin weave (1 mark), shiny face (1 mark), duller back (1 mark), long floats on face (1 mark), reference to weave pattern (1 mark).  
**Any 3 points, 1 mark each** (3 marks)
- (ii) e.g. nylon, polyester, silk, cotton, acetate. (1 mark)
- (iii) e.g. references to strength, abrasion resistance, filament yarn reflects light/smooth, washable as appropriate to selected fibre, crease resistant.  
**2 reasons, 1 mark each** (2 marks)

- (d) Candidate is expected to evaluate the suitability of the two fabrics when used for fashion jeans. Comparisons may be made with denim fabric.

Points may include

**Velvet** is a luxury fabric making jeans suitable for dressier occasions although less suited to everyday wear, aesthetic appeal, warmer than satin, not very hardwearing especially when subjected to friction when it may develop bald patches, may stain easily, difficult to press.

**Satin** is a luxury fabric making jeans suitable for dressier occasions although less suited to everyday wear, aesthetic appeal, fabric may ‘pill’ and quickly look shabby, may be difficult to clean and stain easily.

**Marks awarded as follows:**

Simplistic statements only, candidate typically describes limited aspects of the jeans without making comparison.

(1 – 2 marks)

Candidate shows understanding of the fabrics but tends to describe them rather than make effective comparisons. May not understand the fact that these are fashion jeans.

(3 – 5 marks)

Candidate shows detailed understanding of the two fabrics and intended use. Effective comparisons are made.

(6 – 7 marks)

(7 marks)

- (e) (i) e.g. Denim is made from cotton which requires large amounts of pesticide and chemical fertilizers, large land use for crops, bleaching and dyeing of fabrics require vast amounts of water and produce toxic effluent, do not biodegrade easily and chemicals leach out when disposed of in landfill sites, transportation pollution.

**Marks awarded as follows:**

Basic information with evidence of only limited knowledge and understanding of environmental issues. Candidate will give only superficial reasons for the environmental damage caused by jeans; there will typically be comments that bleaching and dyeing cause environmental damage but specific problems will not be given. Information will be generalised rather than specific and there will be evidence of misunderstanding.

(1 – 2 marks)

Candidate shows knowledge of the different problems caused and will relate specifically to jeans although there may be a lack of specific information. There will be a tendency to relate to a narrow area of environmental concern.

At the top end, there will typically be good coverage of one area of concern, e.g. dyeing or pesticides. There may be elements of confusion and inappropriateness.

(3 – 5 marks)

Candidate shows detailed knowledge and understanding of the environmental problems and relates specifically and accurately to jeans. There will be a range of points with clear explanation.

(6 – 8 marks) (8 marks)

- (ii) e.g. Use of ‘green’ cotton grown (1 mark), without pesticides (1 mark), pre-dyed cotton (1 mark), cleaning of effluent before disposal (1 mark), modification of processes to use less water (1 mark), use of biostoning (1 mark), recycling of old jeans (1 mark), encourage consumers to buy better quality jeans which last longer (1 mark), fewer fashion ‘fads’ (1 mark), less packaging (1 mark), use of wind/wave power to run factories (1 mark), factories sited near to raw materials (1 mark), environmentally friendly bleaches (1 mark).

**Any 5 points, 1 mark each (other examples may be included).** (5 marks)

**Total 40 marks**

*Question 2*

- (a) (i) Candidate may respond through a diagram and/or written description. ‘Sandwich’ of different fabrics (1 mark), top fashion fabric (1 mark), middle wadding layer (1 mark), lower lining/inside layer (1 mark), stitched together (1 mark).  
**Any 5 points, 1 mark each** (5 marks)
- (ii) Candidate may respond through a diagram and/or written description e.g. the quilted fabric has a wadding filling (1 mark). This traps air (1 mark), and prevents cold air from reaching the body (1 mark) and warm air from leaving the body/keeps warmth in (1 marks).  
**Any 4 points, 1 mark each** (4 marks)
- (iii) e.g. bulked (1 mark), bonded fabric (1 mark), contains lots of spaces for air entrapment (1 mark), lightweight (1 mark), washable (1 mark), does not crease (1 mark), can be made in different thicknesses (1 mark), soft (1 mark), dries quickly (1 mark), relatively cheap (1 mark), flame retardant (1 mark). Not ‘strong’.  
**Any 6 points, 1 mark each** (6 marks)
- (b) (i) e.g. Polyester/acrylic fibre or recycled plastic bottles (1 mark), very soft (1 mark), knitted construction (1 mark), brushed/nap (1 mark), on both sides (1 mark), different weight available (1 mark), may have special finishes (1 mark), such as anti-pill, water resistance, wind proof (1 mark).  
**Any 5 points, 1 mark each; an explanation may count** (5 marks)
- (ii) e.g. much lighter in weight, softer, more fluid/flexible fabric, less absorbent so quicker to dry, polyester fibre and single layer fabric so easier care, less bulky yet same warmth, easier to manufacture fabric and products therefore cheaper, can have various built in properties, e.g. windproof.

**Marks awarded as follows:**

Little understanding, simplistic statements only, candidate typically concentrates on aspects of the fleece without making comparison with quilted fabric. Will describe fabric and typical uses with little, if any attempt to analyse popularity. (1 – 2 marks)

Candidate shows understanding of the differences between the two fabrics but in limited areas only. Some parts of the response will be descriptive of the fabrics but there will be sound attempts to analyse popularity of fleece over traditional fabrics. (3 – 5 marks)

Candidate shows sophisticated understanding of the differences between the two fabrics in a number of areas and is able to give a clear explanation for the popularity of fleece. (6 – 8 marks) (8 marks)

**Total 28 marks**

*Question 3*

- (a) (i) e.g. open-ended, ‘invisible’ concealed, trouser zips, chunky zips, decorative zips, metal and nylon zips, extra lightweight zips, 2-way/reversible zips, standard, but not ‘normal’ zips.  
**Any 3 types, 1 mark each** (3 marks)
- (ii) e.g. open-ended zips for garments required to open fully, ‘invisible’ zips for fashion products, trouser zips for jeans, chunky zips for heavyweight products, decorative zips for fashion products, extra lightweight zips for delicate fabrics (1 mark)  
Any product appropriate to zip types named, **1 mark each** (3 marks)
- (iii) e.g. open-ended zip opens fully (1 mark), allows garment to be put on easily (1 mark); invisible zip looks like seam (1 mark), does not spoil line on fashion products (1 mark); extra light zips are featherweight (1 mark), do not drag on light fabrics (1 mark).  
**3 explanations, 2 marks each** (6 marks)
- (b) e.g. safety considerations, weight of fastenings appropriate for fabric, compatible with care needed for fabric, aesthetic considerations, cost/ease of application, fashion issues, availability of fastener, type and use of product, target market.
- Mark awarded as follows:**
- Little understanding, simplistic statements only, candidate typically concentrates on fashion issues with few examples given. Will describe fasteners and typical uses with little, if any, attempt to analyse choices. (1–2 marks)
- Candidate shows understanding of the issues to be considered but in limited ways only. Some parts of the response will be descriptive of the fastenings but there will be sound attempts to analyse choices. Some appropriate examples given. (3–5 marks)
- Candidate shows sophisticated understanding of issues to be considered and is able to give a range of appropriate examples. (6–8 marks)
- (8 marks)



- (c) e.g. use of interfacing/support to ensure strength, flat finish, accurate matching and placement, even/neat stitching, neat finish on back of product, securely attached, accurate sizing buttonholes/loops.

**Marks awarded as follows:**

Little understanding, simplistic statements only, candidate lacks understanding of issues relating to the application of fastenings and gives few accurate examples. (1 – 2 marks)

Candidate shows understanding of QC in relation to the application of fastenings but in limited areas only. Some parts of the response will be confused but there will be a limited range of appropriate examples to support issues raised. (3 – 5 marks)

Candidate shows sophisticated understanding of QC in relation to the application of a range of fastenings and provides a range of accurate examples across a number of areas. (6 – 8 marks)

(8 marks)

**Total 28 marks**

*Question 4*

- (a) e.g. looks like wool/aesthetically pleasing (1 mark), warm (1 mark), crease resistant (1 mark), so little ironing required (1 mark), shrink resistant/keeps its shape (1 mark), lightweight (1 mark), soft to touch (1 mark), does not shrink so easy to care (1 mark), not very absorbent (1 mark), so dries quickly (1 mark), durable (1 mark), not as irritating to skin as wool (1 mark), cheaper than wool (1 mark).  
**Any 6 points, 1 mark each** (6 marks)

- (b) e.g. **Cotton** is the majority of the fibre content, adds absorbency and strength, adds bulk and weight so sweater better suited to regular wear, reduces overall cost.  
**Angora** is a luxury fibre, contributes softness and warmth, makes fabric ‘fluffy’ but may irritate skin when used alone, not very hardwearing, very expensive and difficult to care for.  
**Nylon** adds abrasion resistance, reduces absorbency of other fibres so quicker drying, may allow for sweater to be heat-set into shape so shrinkage reduced, lightweight so counteracts weight of cotton, reduces overall cost, reduces creasing.

**Marks awarded as follows:**

Basic information, will tend to concentrate on the properties of the individual fibres with evidence of only limited understanding of the effects of blending them. Qualities will be generalised rather than related specifically to the sweater.  
There will be confused and inaccurate information. (1 – 2 marks)

Candidate shows knowledge of the properties of the individual fibres and is able to give limited explanation of their suitability for the sweater and their overall contribution to the blend. There will be some understanding but some points may be general rather than specific. (3 – 5 marks)

Candidate shows good knowledge of the properties of the individual fibres and is able to relate to their suitability for the blend for a fashion sweater but there may be some misunderstandings. (6 – 8 marks)

Candidate shows detailed knowledge and understanding of the properties of the individual fibres and their combined contribution to the blend. The overall qualities of the blend will be given detailed and accurate consideration with clear explanation of points made. (9 – 10 marks) (10 marks)

- (c) (i) Weft knit has 2 different sides (1 mark), smooth face (1 mark), ridged/textured back (1 mark). Rib knit same on both sides (1 mark), textured appearance/'line' down fabric (1 mark), rib is bulkier (1 mark).  
**Any 4 points, 1 mark each.**  
 Must be at least one point about each fabric. (4 marks)
- (ii) Rib knit has greater stretch widthways (1 mark), but length shortens (1 mark), does not curl when cut (1 mark), bulkier (1 mark).  
 Weft knit more stable (1 mark), curls when cut (1 mark), rib knit stretches more than weft knit (1 mark).  
**Any 4 points, 1 mark each.**  
 Must be at least one point about each fabric. (4 marks)
- (d) Handwash allows for minimum agitation (1 mark), angora content likely to shrink (1 mark), as wool/hair type (1 mark), scales interlock (1 mark), will cause felting (1 mark), resulting in loss of texture/matting (1 mark), angora may 'pill' with friction of washer (1 mark).  
**Any 4 points, 1 mark each.** (4 marks)

**Total 28 marks**

Question 1:		40 marks
Question 2:	28 marks	
Question 3:	28 marks	
Question 4:	28 marks	
2 question 28 marks each		56 marks
Quality of written communication		4 marks
Paper total:		100 marks