

PART ONE: FABRIC CHARACTERISTICS AND BODY SHAPE

Chapter 1 Fabric characteristics and garment shapes

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Fabric characteristics and garment shapes

FABRIC CHARACTERISTICS

The background

This book has been revised to help students and designers make intuitive decisions when handling and comparing fabric ranges. Its aim is to help them identify the fabric characteristics that effect the final shape of a garment. It explains how they can determine the cut of the garment pattern.

This does not mean that technology is not important. Chapter 12 offers a basic overview of the main processes used in producing fabric. It is essential that all clothing design students understand a fabric's fibre, structure, finish and technical performance, and also how to access the necessary technical information. However, this is not a book on textile technology, it is about the relationship of fabric to pattern cutting.

The visual appearance of any garment is directly affected by the characteristics of the fabric in which it is made. Selecting the correct fabric for a design is difficult when working with the infinite variety of fabrics used in the textile industry. Some computer programs are used to realise three dimensional (3D) models of fabric on virtual models (see page 22). However, the selection of a fabric by a designer usually comes at a much earlier stage in the creation of a range. Computer programs at this stage are more useful for decisions such as colour and pattern. Determining the suitability of a fabric for the *shape* of a design at the concept stage still relies on human discrimination.

Flat pattern cutting is successful when a designer's intuitive knowledge can generate a 3D mental image that is a *visual sense* of the shape that will be created when a flat pattern is cut in a particular fabric. To illustrate this point, the photographs opposite show a circle of two different fabrics:

viscose jersey cut at two different lengths
cotton twill cut at two different lengths

They illustrate two important points:

1. When the circle of the same fabric is cut at a different length, it will produce a different shape.
2. Different fabrics produce different shapes.

Working in small scale Some courses use small scale models for pattern development, but the photographs show the false images of garment shapes created by working in quarter- or half-scale.

Pattern cutting – five fabric characteristics

As it is obvious that different fabrics will produce different shapes, a way to assess them is required. The pattern cutting method or block chosen for creating a style should start with an analysis of the fabric. When the ranges of fabrics were limited, methods of cut were predictable; however, a new approach is required to assess the very different fabrics available today.

The five crucial characteristics that should be considered before deciding the method of pattern cutting or the choice of pattern block are:

weight thickness drape shear stretch

Simple examples in this book illustrate the changes that a fabric can make to the same pattern shape. More complex examples show how the fabric has a great influence on the choice of cut and sometimes the underlying structures that are required to hold a shape.

The five characteristics are listed in this book on a characteristic scale.

The fabric characteristic scale

Weight	light	medium	heavy
Thickness (visual)	thin	medium	thick
Drape (visual)	high	medium	low
Shear	high	medium	low
Stretch	high	medium	low

Each fabric illustrated in the book is described in these terms. Throughout the book, there are no rules that dictate which fabrics should be used for particular blocks or pattern shapes, but visual examples are given which show what is likely to happen when they are cut in fabrics with different characteristics. This approach to pattern cutting does not dismiss aesthetic qualities (for example, colour or texture) but these, and practical decisions of product type and 'fit for purpose', are different parts of the design process.

Testing fabric characteristics

Chapter 2 describes simple testing methods for fabric characteristics. It is designed so that students can develop a sense of a fabric's character and how it will behave. If students begin to assess fabrics in this way, they should be able intuitively to code a fabric for comparison quite quickly. This helps the process of visualising a fabric's capability to produce certain shapes when selecting fabrics.

Notes on the term 'characteristic'

The term 'characteristic' is used because it is a descriptive term that is useful when making design decisions about a garment's shape. The term 'property' should be used when it refers to a fundamental chemical or biological property.

There are enormous problems in defining and measuring some fabric characteristics. Tests and standards have been devised (see Appendix 2) but they have to be carried out in laboratory conditions. The choice of characteristics, and the methods of testing and measuring them (see Chapter 2), were created to be used solely for the purpose of pattern cutting, in order to identify how a fabric will determine a garment's shape.



Viscose jersey

Cotton twill

Full-scale model stands



Viscose jersey

Cotton twill

Half-scale model stands



Viscose jersey

Cotton twill

Quarter-scale model stands



1
*Light weight
calico*



2
*Medium weight
calico*



3
*Heavy weight
calico*



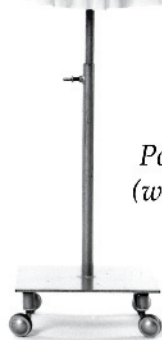
4
*Cotton
organdy*



5
Wool



6
*Polyamide
(warp knit)*



FABRIC CHARACTERISTICS AND GARMENT TOILES

Fabric characteristics

The images on page 9 show that when a circle is cut at the same length in different fabrics (viscose jersey and cotton twill), quite apparent differences in shape will occur. This is because the characteristics of the fabrics are quite different.

Toile fabrics

Most students use calico, mainly of medium weight, for creating garment toiles. Calico is relatively cheap and the fabric structure is fairly stable. The shapes that are produced are predictable (images 1–3 opposite page).

Because unbleached calico is usually unfinished, its drape or stretch qualities are low (see the table below). Therefore, its relationship to many fabrics with drape or stretch characteristics is tenuous.

The images 4–6 (opposite page) show that if the drape or stretch of the fabric selected for a garment is very different from calico, very different shapes will be made. In this case, alternative cheap fabrics with similar drape or stretch qualities should be sought. Calico should never be used to represent knitted fabrics.

Images 1–3: Three circles of the same length cut in calico. The lightweight calico is a different weight and thickness, but the characteristics of drape and stretch are the same. The shapes are predictable.

	weight	thickness	drape	shear	stretch
1. lightweight calico	light	thin	low	med.	low
2. medium weight calico	med.	med.	low	med.	low
3. heavyweight calico	med.	med.	low	low	low

Images 4–6: Three circles of the same length, cut in different fabrics. They illustrate how fabric characteristics, particularly drape, can change the shape of a garment pattern quite dramatically.

	weight	thickness	drape	shear	stretch
4. cotton organdy	light	thin	low	med.	low
5. wool	med.	med.	med.	med.	low
6. polyamide (warp knit)	light	thin	high	low	med.

Constructing a circle for a skirt

(Cut in 4 quarter sections).

Take the waist measurement.

To calculate the radius for a circle: divide the waist measurement by 6.28; example: 62 cm (waistline measurement) divided by 6.28 = 9.87 (round up to 9.9 cm).

To create a quarter circle section:

Square both ways from 1.

1–2 the radius (e.g. 9.9 cm).

1–3 the radius.

Draw a quarter circle from 2–3.

2–4 the length of the skirt (e.g. 60 cm).

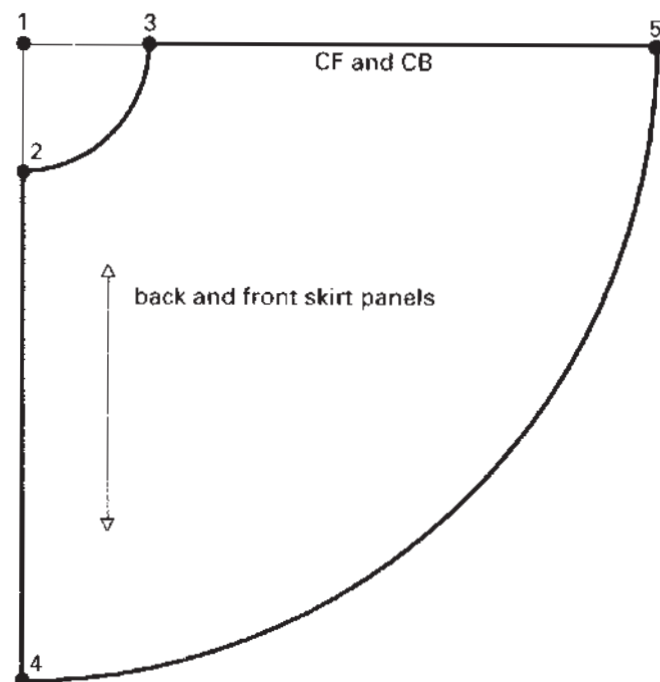
3–5 the length of the skirt.

Using a tape measure or a metre stick, mark out the lower edge of the skirt 60 cm from the drawn waistline.

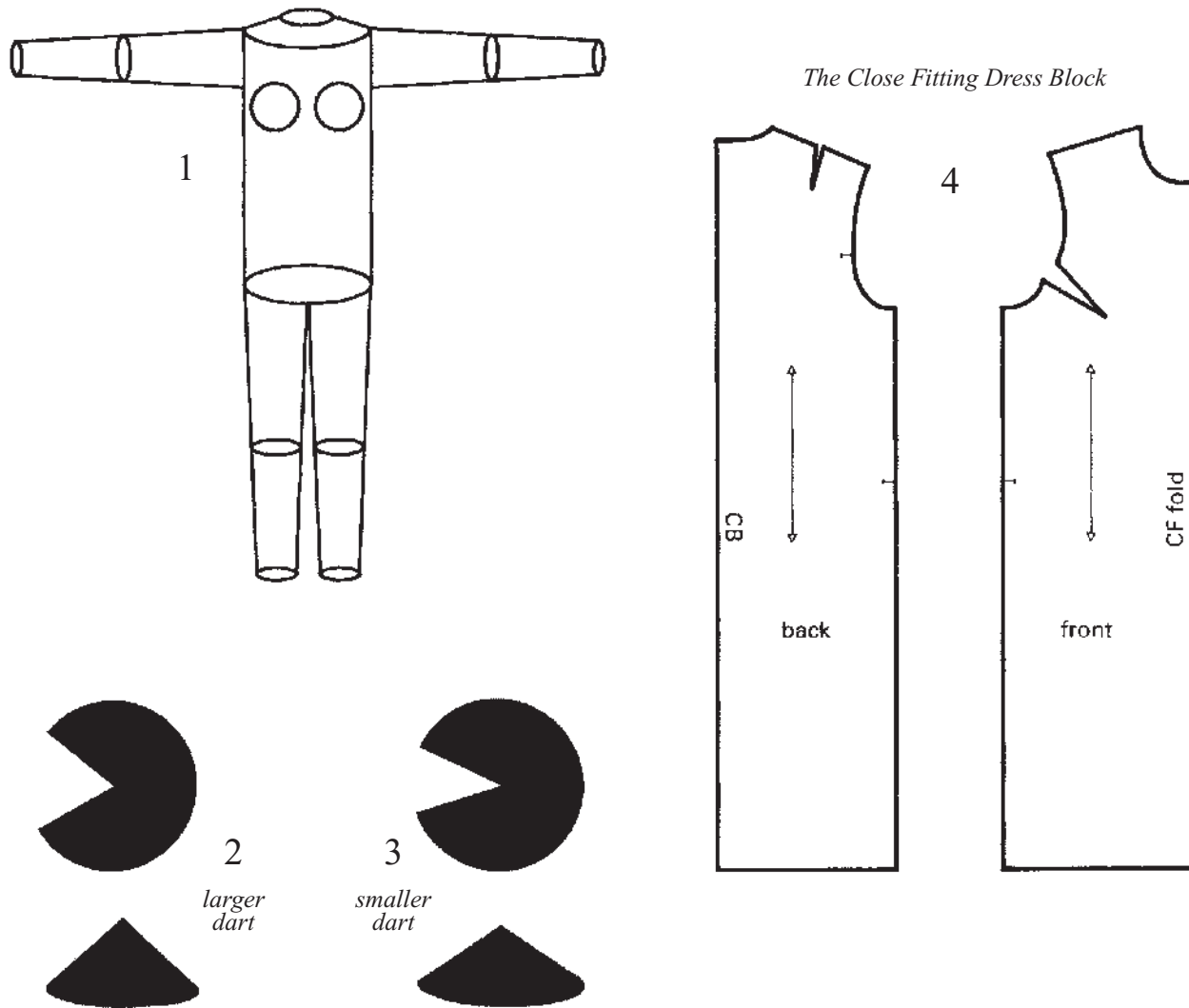
The circle, multi-circles or sections of a circle can be attached to a simple body shape.

The circle, can be attached to a band or yoke to form a skirt.

Circles or parts of circles can be integrated into a pattern shape, in sections or in layers.



FABRIC CHARACTERISTICS AND BODY SHAPES



Look at the human body shape in a simple way. Diag. 1 shows a basic cylinder (the trunk) with other cylinders (limbs) attached. Historically, simple but effective garments were cut based on these basic shapes. But, as you move closer to fit the body shape, it becomes more complicated. The body shapes of women, men and children are all different; curves and eruptions occur in different places and on a different scale. Because the bust is the most extreme example, a female dress stand is used for illustrating fabrics and body shapes.

Blocks are simple cylindrical basic body shapes, developed by pattern cutters for different parts of the body; they can be used as initial shapes for creating designs. Fabric characteristics play a crucial part when selecting a block. The fabrics on the dress stands (opposite page) are of light or medium weight, but have differences in drape and stretch.

Fabrics with high drape or stretch

Image 1 (opposite page)

If a fabric has high drape or stretch characteristics, a close fitting block without darting can be used. The fabric stretches over the bust and shoulder curves, and then hangs as a vertical cylinder.

Fabrics with low drape and stretch

Image 2 (opposite page)

Fabrics with low drape or stretch cannot accommodate an eruption such as the bust. Drag lines will be created that will pull the side seam forward. Therefore, a bust dart is required.

Darting

If a section of a circle is cut out (diag. 2), and the lines are joined, the centre of the circle will rise.

The smaller the section cut out (diag. 3), the lower the rise will be.

A dart in a body block has the same effect.

The closer the fit, the larger the dart has to be.

A dart is required in a close fitting garment made up in a fabric with little drape or stretch.

Image 3 (opposite page)

The close fitting bodice (dress) block with a bust dart was selected (ref. page 208).

The bust dart was transferred to the armhole (diag. 4). The garment now has a perfect 'hang' and a vertical side seam.



1 *Acrylic (weft knit)*
Low shear, high drape and stretch



2 *Polyester (woven)*



3

Low shear, drape and stretch

Fabrics with high shear and drape

If a fabric with high shear and drape is made up into a close fitting garment, it will create a good balanced shape. But if the fabric has no natural recovery, it will become distorted during wear. This means that this type of fabric is usually cut in easy fitting shapes where the strain on the fabric will be less.

However, if a fabric has high recovery, it will allow the narrow shape to have resilience and recover during wear. For example, fabrics made from micro-fibres have this quality and are widely used in lingerie.