

Chapter - 7: Garment Fit

7.1 Pattern Development

At the very beginning of this industry, pattern making was done by skilled workers who were primarily illiterate. W. H. Hulme wrote in his book "The Practice of Garment Pattern making" wrote that the Clothing Industry has been productive in developing systematic methods of applying descriptive data, many of these pattern systems have not been clearly stated. Several years of research on techniques various pattern systems suggest that method adopted may be unrelated to, or divorced from, principles of pattern making. The systems do not state the principles applied have wide variations and are based on the assumptions.

Philip Kunick in his book Modern sizing and pattern Making for Women's and children's Garments has written that it is still a common practice to teach pattern construction for the wholesale trade by means of a drafting scale based on a girth measurement, not only for fixing points or locating parts, but also for drafting a garment of any size. This is rarely done in the wholesale trade, where it is the general practice to cut a pattern in a standard size indication that the exact dimensions are not known and proportionate measurements must be used as substitutes; with the result that extreme sizes, drafted to a hypothetical scale, rarely give a satisfactory fit.

There were just 18 pattern cutting books including Alcega's published from the 16th century to the 19th century in Europe. This fact can be attributed largely to high levels of illiteracy and innumeracy prevalent amongst pattern makers, tailors and dress makers at that time. Traditionally the skills were passed to the apprentices through demonstration and verbal instructions.

7.2 Garment Fitting

Apparel fit is the relationship between the size and contour of garment and those of the human body. A well fitted garment is a garment that hangs smoothly and evenly on the body, with no pulls or distortion of the fabric, straight seams, pleasing proportions, no gaping, no constriction of the body, and adequate ease for movement. Hems are parallel to the floor unless otherwise intended, and the garment armholes and crotch do not constrict the body. It can be defined as a simple matter of length and width in each part of the pattern being correct for the human figure.

7.2.1 Introduction to Fit

Fit refers to how well a garment conforms to the three-dimensional human body. Good fit is crucial to customer satisfaction. However, it is often easier to find clothes in right colours, prices and style that one likes than a well-fitted garment. The effect of a stunning design, gorgeous fabric and exquisite workmanship are destroyed if the finished garment doesn't fit well to the intended wearer. Fit problems may be caused due to careless design, construction or may be the result of individual characteristics of an individual's body. No two

bodies are alike, and sometimes even the left and right halves of the same body are not mirror images of each other.

New technology promises to overcome these problems; a new computer system can optically measure an individual's body in three dimensions. This data is then converted to a computerized, individual pattern, a man's suit designed by this method is ready to be cut out and ready to sew within 7 minutes of receipt of the measurement data. The resultant garments fit accurately as the computerized scanner detects subtle nuances in the shape of the body that normal measurement systems are unable to read. These systems are on the stage of trial; but they would be costly and would take a long time to be readily available.

There are varying opinions on what comprises a good fit. Personal preferences regarding fit are governed by current fashion trends, cultural influences, age, sex, figure type, and lifestyle. The intended end use of the garment also affects the desired fit. For example, a person needs more ease for active sportswear than for spectator sportswear like in a tracksuit.

The relation between the size charts and body dimensions is not constant because of the changes that occur in the human population. Recent body surveys in UK, US, China, Germany and other countries proved that a garment sizing system for a certain body type does not cover more than the 25 per cent of the population for which it is addressed. Correct sizing is a prerequisite to good fit and customer satisfaction. Fit is a function of sizing and it affects comfort, durability of a garment. Sizing is often overlooked as an important issue.

7.3 Elements of Fit

The elements of fit are the parameters on which the evaluation of Fit is generally based on, these are also referred to as five classical elements of fit:-

Grain: for a good fit the garment should be cut on the right grain or in other words on grain. An on *grain* garment hangs evenly and appears symmetrical. If the garment is *off-grain*, it will not hang straight. The garment and seam lines may twist or hang crooked because the fabric on each half of the garment behaves differently. Deviation in the grain line is a result of wrong cutting or stitching or even due to a poor posture of the wearer or figure irregularities that may interfere with the grain of the garment as it hangs on the body.

Set: refers to a smooth fit without any undesirable wrinkles. Wrinkles caused by poor set cannot be ironed out, but result from the way the garment fits the wearer. Set wrinkles usually occur because the garment is too large or too small for the wearer and the garment hangs or sags when worn.

Line: refers to the alignment of the structural lines of the garment with the natural lines of the body. Side seams of the garment should hang like a plumb line down the centre of the side of the body. It should be perpendicular to the floor. Centre front and centre back likewise should fall centre of the front and back of the body and be perpendicular to the floor. Darts and seams such as shoulder seams should visually appear to be straight lines that follow the body part they are intended to fit. Other seam lines should be gradually curving lines like necklines, waistlines, hiplines and armholes. Poor design or construction can result in an *out of line* garment. Even figure irregularities can distort the lines of the garment.



Balance: occurs when the garment is in equilibrium. The right and left side of the garment appear evenly balanced or symmetrical, when viewed from front, back or side of the garment. A skirt is balanced if the legs of the wearer are in the centre and are not touching the front or back of the skirt. Balance relates to grain and line in the garment. A garment is out of balance when it is cut off grain, causing it to hang unevenly. Also if the line of the garment does not follow the line of the body, it will hang out of balance. Poor posture or lack of symmetry in the wearer's body is another likely cause of it.

Ease: refers to the amount of roominess in a garment. Ease is the difference between the measurements of the body of the intended wearer and the measurements of the garment. There are two kinds of ease: **fitting ease** and **design ease**. Fitting ease is in direct contact with the body and is responsible for the comfort factor and design ease of the garment is for aesthetic appearance. A garment must contain adequate ease beyond the actual measurements of the wearer to allow room for ordinary movements like walking, sitting, reaching out and even breathing. Ease in this context is called Fitting ease. Design ease is the extra style fullness added to the fitting ease. All the garments have fitting ease but design ease is optional as it is added purely for the sake of appearance and giving the garment its style.

7.4 Evaluating Fit

In evaluating the fit of the garment, all the sides of the garment must be examined. The fitting should start from the top and move downwards. The analysis of fit is a complex process and remains a challenge, for both industry and customers. Apparel fit is a complex issue but of great importance for judging perfect clothing appearance, and that various technologies used, such as a 3D simulated form, may lead to more efficient decision making in the process of product development and quality control. The following body parts should appear as:

7.4.1 Shoulders

Shoulders should appear smooth and feel comfortable. Seam should lie on top of the shoulder. In regular styles the arm scye seam should fall on edge of the wearers shoulder. The shoulders of the garment should be wide enough so that the sleeves hang smoothly. If the shoulders are too narrow, the sleeves will pull across the upper arm and cause wrinkles. If fashion trends require the shoulders to be narrow or wider the pattern still should allow sufficient movement. The shoulder slope of the garment should match the shoulder slope of the wearer.

7.4.2 Bust

Bust/Chest if the garment is too small, the seams or closures are at the centre front or back are going to pull and gape open. A larger bust or highly developed chest often causes the button closure to gape open at centre front or back, also the garment may ride up because the larger bust curves takes up more length. A well-fitted dart always points towards the fullest part of the of the body curve it is intended to fit. The tip of the dart should end about an inch before the fullest part of the curve. Darts that are too short or darts that extend beyond

the fullest part of the curve result in a bubble at the dart tip. Darts occurring anywhere in the garment follow the same principle. The practice of eliminating darts to speed construction creates diagonal wrinkles on the bodice front.

7.4.3 Neckline

Necklines should be large enough to fit without pulling or chafing but not so large that it doesn't lie flat against the body in front and back. The front of the basic neckline should always be lower than that of the back.

7.4.4 Collar

Collar the most important factor in the fit of the collar is the neck circumference. The circumference of the collar should be at least 1/4th of an inch bigger than that of the neckline or just large enough for one to insert two fingers between the neck and collar. A properly fitted collar should be smooth and stays in place when the wearer moves. It should not be so tight that it pulls. A tight collar is uncomfortable and makes the neck look large. But neither should it be so loose that it gapes.

7.4.5 Armscye

Armscye must fit well for the garment to be comfortable and attractive. The circumference of the arm scye should be large enough so they do not pull at the front and back of the garment, but not so large that it gapes. In a well-fitted armscye, the base of the arm scye is cut close to the armpit, but not so close that it bites into the armpit. It should be cut about an inch below the armpit. This provides adequate comfort, room for movement, and close fit without wrinkles in the armscye area. If the armscye are too tight they are snug and uncomfortable. Armscye in the front should be more deeply cut than at the back as most of the movements are in the front.

7.4.6 Sleeves

Sleeves that fit well are attractive and comfortable. The circumference of the basic sleeve should be loose enough so that it does not bind or has wrinkles horizontally around the arm. A tight sleeve apart from being uncomfortable makes normal arm movements impossible. Sleeves can be as loose as one wants but only problem would be to wear the garment under a fitted jacket. A well-set jacket sleeve hangs with a slight angle towards the front. The crosswise grain at the bicep should lie parallel to the floor.

7.4.7 Waistline

Waistline fit is essential for comfort. The waistline of the garment should not be so tight that it binds and rolls. It should have plenty of room for breathing and eating and it should return to its position after the arms are raised or lowered. It should not be so loose that it stands away from the body, droops, or adds bulk when a top or shirt is tucked in or worn under another garment. The narrowest part of the garment should fall at the wearer's waist. If there are buttons at the waist the garment should not pull or strain at the closure. A jacket should be big enough at the waist so that a person can sit even when it is buttoned.



7.4.8 Hips

The fit of the hip area is critical for fitting skirts or trousers. If there is adequate room in the hip area other parts of the garment can easily be altered to fit. Garments with enough room in the hip, thigh and abdomen area fit smoothly without pulling, wrinkling or riding up. Pocket, pleats or vents that open up indicate that garment is tight in the hip or abdomen area. If the garment has excess ease in hip or thigh area it will result in vertical folds.

7.4.9 Crotch/Seat

Trousers and other bifurcated garments require a well-fitted crotch for comfort and durability. A properly fitted crotch doesn't cut or bind the wearer between the legs and conforms to the shape of the buttocks. There should be slight but not excessive ease in the crotch area. Crotch length generally has one inch of ease in the crotch area for trousers. The back of the crotch seam should be longer and more deeply curved than the front as the backside of the buttocks are more curved than the front. Bigger sizes require longer and deeper curved crotch lengths at the back. Diagonal wrinkles radiating from the crotch area are the result of, crotch curve not long enough to accommodate the size of the buttocks. Diagonal wrinkles in the front may also be due to the wearer's big abdomen. Wrinkles emanating upward from the crotch area indicate a too tight and high crotch, resulting in chafing and discomfort. Wrinkles emanating downwards from the crotch area indicate a low and loose crotch; it bags and sags, restricts walking and has increased probability of ripping from strain of movement. If the rise may be lengthened or shortened, the waistband should also be raised or lowered. Rise should not be lengthened or shortened in the crotch length as the same may lead to problems where none existed.

Another important rule of the fitting apart from knowing how to fit is when not to fit. Clothes must not only fit but need to flatter as well. There is absolutely no need to fit a garment so close to the body that it looks bad, also there is no need to stick to the design if it does not flatter the body. The real expertise lies in the fact that one is able to strike a balance between the lines of the design and the lines of the figure. The ability to do this is a skill that one learns by training the eye to see and judge as to what flatters the body.

Fitting is like sculpturing it creates a three dimensional form. Another question that is frequently asked is how many times one should fit, the answer to this is as many times as it takes to fit well.

7.5 Other Factors in Fit

Mathematical calculations and pattern corrections alone cannot guarantee the fine fit of the garment. They can only provide an approximation of one's figure needs. The other points to be considered are:

- ♦ The style of the garment whether it suits oneself or not.
- ♦ The necessary and sufficient ease in the garment.
- ♦ The posture and the individual shape of the wearer.

These can truly be evaluated only on a fabric test fit. Since only minor changes can be made once the garment has been cut on the fabric. Hence a test fit can save lot of wastage. There are times when test fit is not necessary, those are when one is sure of the style, know from experience how to adjust the pattern, have sufficient material to re-cut if necessary and have sufficient seam allowances to borrow in emergencies. But if one has any doubts whatsoever, then test fitting is a must.

Commonly used test material is muslin, bleached or unbleached, should be used in a similar weight to that of the final fabric. Any other solid coloured plain weave fabric like poplin in a similar weight to final fabric would do. A plain surface is recommended as this clearly shows all seams, darts and other style details. Layout the pattern cut and mark your test fit fabric with equal amount of care as you would your final garment fabric.

Put the trial muslin together. The quickest way to get the effect of the finished garment without actual stitching is to overlap and pin all the seams lines. Pinning gives the same result and information, that one wants without going to the machine. It is so much faster and easier to unpin and then re-pin than to rip stitching and re-stitching.

Pins should be placed at right angle to the seam line, as in this method there is least amount of strain or pull on the seam, and it does not gape. While test-fitting trousers remember to baste stitch the crotch seam instead of pinning.

Check the test fit muslin and make correction till fully satisfied. Mark all the corrections and the same should be transferred on the pattern for it is the paper pattern that one should use to cut the final fabric and not the test fit muslin. Mark new notches as the old ones may not hold good after the alterations. Check the lengths of two matching seams to ensure that the alterations have not created more problems, e.g. if you have corrected the dart intake of side seam dart in the front, check to ensure that both the side seams are still equal or not and if required make the necessary changes.

7.6 Methods of Fitting

There are two kinds of fitting:

One is the first **test fit** that is done on muslin at the time when the pattern is made. A basic test fit is done to check the pattern fitting; the pattern is cut with relevant seam allowances and pinned in place for test fitting. Make sure that seams and darts are in place. This fitting is always done from the right side of the garment, as it is easier to make changes and corrections. These corrections become the new seam lines for the garment. Check the garment for ease and fullness. It is important to mark buttons and buttonholes at right places in this fit.

The second is **after the garment** has been stitched before final finishing. Stitch the garment with relevant interfacing/ or underlining in place press it well and test fit to check the position of darts, seams, puckers if any and locate the position of outer seams. This type of fitting refines and perfects the fit of the garment.

Other times, when refitting becomes essential are, if readymade garment has been



purchased from the market some alterations may be required for it to be fitted to an individual's size and also if there are changes in the body size, like if someone has grown thin or has put on weight or if a child has gained height, refitting may become necessary. The methods by which each pattern seam or area is to be corrected and altered depends on the type of problems and nature of the fitting defect.

Summary

The chapter covers the following topics:

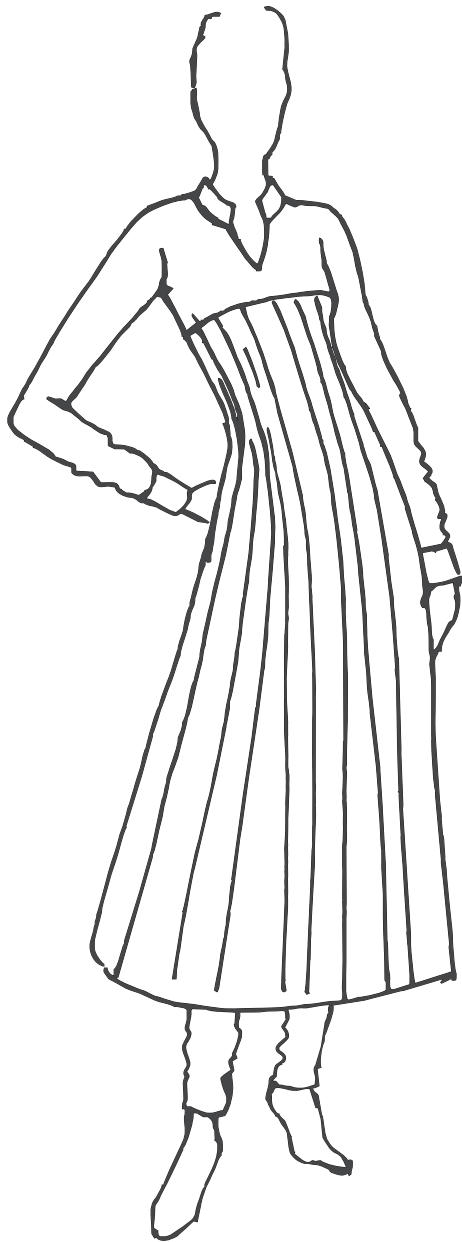
1. The definition of garment fit, various elements of fit like ease, grain, set balance and line.
2. The crucial areas of fit and general problems associated with it
3. Methods of fitting and mathematical method of fitting.
4. Issues in fit and methods of solving problems of fit.

Exercise

1. Check your own wardrobe what are the various fit issues you can identify. Try out garments and see if you can identify methods of correcting it.
2. Collect pictures of various figure types from newspaper and magazines
3. Fill in the blanks
 - a. Fitting is like _____ it creates a _____ form.
 - b. Five elements of fit are _____, _____, _____, _____ & _____.
 - c. Ease is of _____ kinds, i.e. _____ & _____ ease.
 - d. _____ occurs when _____ is in equilibrium.
 - e. The garment is called _____ grain if it is not cut on the _____ grain of the fabric and it would not _____ well.
 - f. The side seam of the garment should _____ straight on the _____ of the _____.
 - g. There are _____ methods of evaluating the _____ of the garment.
 - h. Pins should be placed _____ to the _____ line, as there is _____ of strain or pull on the _____.
 - i. Check the _____ muslin and make corrections till _____ satisfied, _____ all the _____ corrections and _____ on the pattern.
 - j. _____ pulls in a garment indicate that the garment is _____ and _____ folds indicate that it is _____.

STYLE VARIATIONS





Glossary

1. **A-Line:** Fitted dress or skirt, in which the side seams go out at an angle. An A-Line skirt is wider at the hem than at the hips but not full enough to fall into folds.
2. **Armhole:** The seam where bodice joins the sleeve, a hole for the arm, it is important to have the depth and width of the armhole to be perfect for an individual especially when clothes are closely fitting.
3. **Armhole Scye:** Term used to describe the scooped out curve of the armhole on a block or pattern.
4. **Balance:** Refers to hang and proportion in a garment, in flat pattern cutting method it is often difficult to judge correct balance until it is test fitted.
5. **Balance Marks:** Marks made on edges of pattern pieces to ensure that pattern pieces match. They are useful as a construction guide on all seams, however, balance marks are vital when different shapes are to be joined together. While, cutting the pattern make small pencil marks at the edge of the paper they are also referred as notches.
6. **Baste:** To stitch pieces of a fabric together temporarily by hand or by machine so that the garment may be fitted or the seams stitched permanently.
7. **Bell Sleeve:** A style of sleeve that is full and flared at elbow or wrist level
8. **Bias:** Fabric that is cut at 45° to wrap and weft grain
9. **Bias Cut:** Refers to a garment such as shorts, skirt, dress or underwear, the pieces of that are wholly or partly cut on the bias.
10. **Clip:** A small snip or cut made in the edge of fabric. All curved edges must be clipped so that the fabric lies flat when final pressing is done.
11. **Crotch Point:** This is where trouser inside leg seams meet the crotch seam. The exact position depends on the figure but the crutch point should be towards the front of the body.
12. **Cutting Board:** A specially constructed folded corrugated board, which opens out to cover a table or bed to provide a surface on which to cut out or make patterns.
13. **Cutting Line:** The point beyond the stitching line or seam lines where the fabric is cut. With patterns that have no seam allowance the cutting line is marked on the fabric using chalk or fabric pen. On a commercial pattern the printed outline is the cutting line for both pattern and fabric.
14. **Dart:** A triangular fold stitched to taper gradually to a point. It makes the fabric shape easily over 3D human body.
15. **Dart Tuck:** Stitching of the dart shaping but stopping short of the dart point, it appears as a tuck from the right side of the garment.



16. **Double Breasted:** A style of front fastening that wrap over to fastens on the left of the body instead of at the center front.
17. **Double Pointed Darts:** These are also called fish darts and are used to shape waist in a one piece dress.
18. **Drafting:** The term applied to drawing and cutting a paper pattern.
19. **Drawstring:** A piece of cord used to tie and hold the waistline of a dress, skirt or trousers, or neckline or hems in place.
20. **Ease:** The amount added to measurements in order to ensure that there is room to move while wearing the garment. The amount varies according to current fashion
21. **Easing:** This is needed when joining two edges that are of different lengths and shape. The longer edge makes a slight bubble of fabric as it is seamed which provides a slight ease for movement. Often the edge to be eased would have had a small dart in that position on the original block. Examples of easing include sleeve heads in to armhole, back shoulder on to front shoulder, back edge of sleeve seam on to front edge at elbow level.
22. **Empire:** A high waist seam it can be on a dress, tunic or nightdress, the upper garment is usually fitted over the bust and often the lower section of the garment is pleated or gathered into the waist.
23. **Extended Shoulder:** The shoulder seam is lengthened and extended so that the armhole seam slopes outwards and runs across the top of the arm instead of passing over the shoulder bone. The underarm must be lowered to allow room for raising the arm.
24. **Flare:** Shaped fullness added to a sleeve skirt edge. While cutting a pattern flare is added by cutting from top to bottom of the basic shape and spreading the pieces at one edge only.
25. **Flounce:** A full circular edging for neckline sleeves and hems.
26. **Fold-back Facing:** A way of finishing straight edge such as button edge of a blouse, by eliminating the seam at the edge. Add a sufficiently wide extension to the edge of the pattern and attach interfacing to extend over the fold line to provide a firm edge when the facing is folded onto the wrong side. Useful in facing on light or transparent fabrics where a seam would be bulky and visible.
27. **Forearm Seam:** The seam nearest to the front of a two piece sleeve.
28. **Frill:** A strip of fabric of any width gathered and attached to a garment as an edging.
29. **Godet:** A flared or triangular insert in the hemline of skirts, sleeves and trousers.
30. **Gorge Line:** A short seam that joins the end of a classic collar to its lapel.
31. **Grading Sizing:** Refers to the way that a pattern is adjusted to the other size while keeping the style. Used in the production of commercial patterns.
32. **Grain:** The direction of yarns in a woven fabric along the length to across the width.

33. **Gusset:** A small piece of fabric inserted in the seam to allow room for movement. Gussets are most commonly required in kalidar kurta sleeves to allow arm movement.
34. **Halter:** A style of neckline that has a strap or an extension of fabric running from the front armhole to around the back of the neck edge.
35. **Piecing:** Joining fabric before cutting to shape. This is required in case a pattern piece is too wide for the fabric width.
36. **Princess:** Length wise seams passing through the apex and giving shape to the garment. The seam may originate from armhole, shoulder and neckline. The seams are named accordingly e.g. a princess seam originating from shoulder is called shoulder princess. Dresses with these style lines are also called panel dresses. Both princess and panel seams are shaped because they include the bodice darts and are useful when a closer fit is required in the garment.
37. **Rise:** A term normally used in relation to men's trousers it refers to the length of the front crotch seam from crotch point up to waist.
38. **Shaped Facing:** Shaped piece of fabric used to finish the edge of a garment, usually a shaped edge such as neckline or sleeve edge and the facing is shaped to correspond the edge to be finished. The facing shape is obtained by tracing the garment edge; seams in the facing usually match those on the garment.
39. **Shift:** A simple straight dress of any length, usually sleeveless
40. **Shrinkage:** Cotton fabric should be washed before cutting
41. **Square Neck:** A neckline may be squared at front or back. Care should be taken to keep the neckline fairly shallow so that it doesn't gape.
42. **Stay:** An extra piece of fabric such as tape, seam binding or interfacing stitched into a seam that might be liable to stretch or lose its shape.
43. **Taper:** To gradually reduce without changing the shape drastically e.g. patterns of a trousers.
44. **Tent:** The silhouette of a dress or coat that is fitted at the shoulders but slope straight out on the side seams.
45. **Toile:** A pattern made in muslin test fit on a dress-form to check the balance and position of style features etc. The toile can be taken apart and used as the pattern or the adjustments can be transferred to the original paper pattern.
46. **Tunic:** A simple short sleeveless dress.
47. **Undercollar:** The under section of a collar that folds or rolls.
48. **Un-pressed Pleats:** Even folds of fabric that are stitched across one end but which are not pressed below that point.



49. **Vent:** A slit in the back hem of a jacket, which allows person wearing it, to move, bend, sit or use the pocket without pulling the jacket. Vents at skirt hems are usually called slits.
50. **Wrap:** Yarns that run through the entire length of the roll or piece, it is also called straight grain. Most of the pattern pieces are cut on this grain.
51. **Weft:** Yarns that runs across the width of the woven fabric are also called filling yarns it is also called straight grain. The weft yarns are often weaker than the wrap yarn.
52. **Welt:** Finishing of a pocket or a particular type of ridged seam.
53. **Wrap Over:** A style of blouse, dress, skirt and jacket where one side of the front overlaps the other and is often fastened with a belt.
54. **Yoke:** A small piece of the garment which is at the waist of a skirt or trousers or at the shoulders in a blouse or dress. The functional purpose of a yoke is that it generally provides a horizontal seam which can hold fullness. The seam line with which a yoke is attached to the main piece of the garment is called a yoke line. This seam line can be emphasized with piping, lace, ribbon etc.

