

ABSTRACT

BOWLES, ALLISON ELIZABETH. Size Grading of Zero-waste Garments (Under the direction of Dr. Katherine Annett-Hitchcock)

Sustainability in the apparel design and production processes is a critical issue. Many companies are seeking to reduce waste through thoughtful patternmaking, marker layout and cutting.

Existing studies focus on the zero-waste design process and role of the designer in this process, but few look at how a zero-waste garment may be graded into different sizes. This pilot study tested two methods for grading zero-waste garments: (1) traditional grading and (2) varying fabric width for each size. The fabric utilization, fit, and design integrity was evaluated for each grading method in order to compare how each might meet industry expectations for garment grading. The “jigsaw” zero-waste design method was used to redesign a non-zero waste garment so that the pattern pieces interlock and use 100% of the fabric in the marker. Grade rules were assigned to cardinal points on the “jigsaw” pattern pieces, and then the pieces were graded to a size 4 and size 12. The second grading method was performed by reducing the width of the fabric to 36” for the size 4 garment and increasing the width of the fabric to 44” for the size 12 garment. The “jigsaw” marker was scaled up and down proportionally in order to fit the new fabric widths. Quantitative data related to fabric utilization in the markers for each garment was gathered and compared. Qualitative data was gathered from three individuals with fitting experience by rating each garment on specific fit and design elements using a Likert-type scale. The results of the study found that the highest evaluated garment was the size 4 garment that was scaled to 36” wide fabric and the lowest evaluated garment was the size 12 garment that was scaled to 44” wide fabric. The study concludes that scaling a garment to different widths of

fabric may be an acceptable grading method FOR zero-waste garments; however, the success of the fit and design integrity is dependent in part on the amount of increase in the fabric width.

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Size Grading of Zero-waste Garments

by
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DEDICATION

To Mom and Dad

For always supporting me, no matter where I wander.

BIOGRAPHY

Allison Bowles was born in Mocksville, North Carolina on December 16, 1984. She received a Bachelor of Science in Textile and Apparel Management from North Carolina State University's College of Textiles. Following her undergraduate degree Allison worked in the hosiery industry as a brand manager for several major national brands. She returned to the College of Textiles for her master's degree so that she could focus her career on sustainability in the textile supply chain and entrepreneurship.

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Chapter 1: Introduction

Sustainability in the apparel design and production processes is a critical issue. Many companies are seeking to reduce waste through thoughtful patternmaking, marker layout and cutting. A good example of this is zero-waste pattern making. Zero-waste pattern making, which uses all of the fabric in a marker layout, drastically reduces the amount of fabric waste in apparel production. Existing studies focus on the zero-waste design process and role of the designer in this process, but few if any look at the barriers of manufacturing zero-waste garments and how technology currently used in the industry may be used to overcome these barriers. Grading pattern pieces for multiple sizes is one of the barriers that exist for zero waste garment manufacturing. This study will test two methods for grading zero-waste garments, as outlined by Rissanen (2013): traditional grading and using varying widths of fabric for each size. For each method of grading the following analyzes will take place: the amount of fabric waste in the marker, garment fit of each size, and the design integrity of each garment.

1.1 Background of the Problem

Rissanen states in his dissertation, *Zero-waste fashion design: a study at the intersection of cloth, fashion design and pattern cutting* (2013), several limitations for the manufacturability of zero-waste garments. One of the significant limitations that he lists is the ability to grade multiple sizes of a zero-waste garment in a way that does not waste fabric for each size and also does not compromise the overall design and fit of the garment. Grading involves not only the creation of different sizes, but also includes pulling the sizes into markers that can be cut.

Rissanen then goes on to outline five possible solutions for this problem; however his study does not go on to evaluate each solution through practice.

1.2 Purpose of the Study

The purpose of this pilot study was to explore efficient pattern grading for a zero-waste garment. This will include: measuring fabric waste, evaluating design integrity, and evaluating fit. The works of Timo Rissanen and Holly McQuillan in zero-waste pattern making are used as a basis for the study. A flat pattern for an existing garment designed and developed by the researcher was converted from a non-zero waste garment to a zero-waste garment, and then the garment was graded using two different grading methods put forth by Rissanen in his dissertation (2013):

1. Conventional grading
2. Using different fabric widths for each size

Gerber Accumark CAD software was used to grade the pattern pieces, create markers, and measure the fabric utilization of each garment.

1.3 Research Questions

1. Can zero-waste garments be graded without creating fabric waste?
2. Do graded zero-waste garments meet industry expectations for fit?
3. Do graded zero-waste garments meet industry expectations for design integrity?

1.4 Limitations of the Study

This pilot study had the following limitations:

1. A pre-set grade rule table, which aligned with industry 1 & 1 1/2" grading standards, was used.
2. Dress forms by different brand makers, which were available at the school, were used to evaluate the garments.
3. A convenience set of evaluators was used to evaluate the garments. The evaluators had varying levels of expertise and experience, though all were enrolled in an appropriate graduate program.
4. Muslin fabric was used in widths currently available at retail.

1.5 Definition of Terms

Cardinal point: Point on a pattern piece that is moved in order to change the size of a garment.

Edge changes grading method: uses grade rules that are assigned to each cardinal point that define the precise increase or decrease in both horizontal and vertical directions from the base size (Schofield, 2007)

Embedded jigsaw method: A traditionally designed garment pattern is embedded into a zero-waste pattern and the embedded pattern is treated as a fixed area (McQuillan, 2011).

Grade rule: numbers that define the amount of increase or decrease between sizes in a size run.

Grading: the process of increasing or decreasing the base size pattern according to a set of body measurements and proportional relationships to develop a range of sizes for production.

Jigsaw method: zero-waste design method where all pieces of the garment interlock with each other in the marker and generate no fabric waste from their production.

Manual grading method: the “grading information is expressed as the distance and direction to move the pattern from one cardinal point to the next cardinal point” (Schofield, 2007).

Marker: lay plan of pattern pieces to be cut for a garment.

Marker maker: individual who creates the marker.

Minimal cut method: cuts are made into the fabric with most of the garment shape coming from slashes in the fabric rather than separate tailored pieces; the excess fabric is draped about the body.

Pattern maker: individual who creates the pattern pieces for a garment.

Proportional grading method: The proportional technique begins with base size that is graded up to the largest size and down to the smallest size in the size range. A diagonal line is drawn

from each cardinal point of the base size directly to the corresponding cardinal points on the largest size. The diagonal line is divided by the number of sizes between the base size and the largest size. Each new pattern piece is drawn from point to point on the diagonal lines (Schofield, 2007).

Size specifications: lists of the critical measurements needed to maintain the fit and style of a garment across sizes (Ashdown, Lyman-Clarke, Smith, & Loker, 2007)

Tessellation method: zero-waste design method that uses one shape that repeats by fitting perfectly together with no gaps between the shapes.

Zero-waste garment: a garment that has been designed and pattern cut in such a way that when the garment is cut, all of the fabric in the garment, and none is left behind as off-cut waste.

Chapter 2: Review of Literature

Sustainability is becoming increasingly important to the apparel industry. In order to become more sustainable, the industry must move away from traditional, linear development processes and rethink the way resources are utilized (Hethorn & Ulasewicz, 2008). One opportunity for improvement is reducing the amount of fabric waste in apparel manufacturing. Approximately fifteen percent of fabric is left on the cutting room floor in traditional apparel manufacturing (Cooklin, 1997). The fabric waste is not only a loss at the apparel production stage; it is also a loss of the “embodied energy of the fabric” which is the “aggregate of raw material, labour, energy and water consumed from fiber generation and extraction, to spinning, weaving or knitting” (Fletcher, 2008, p. 100).

The earliest garments created by humans were simple and wasted little or no material; but with the adoption of tailoring garments to fit the body and the growth of mass production, waste in the design and production processes has increased. Recently, the idea that a garment can be made without discarding any fabric has re-emerged and the practice of zero-waste fashion design has grown in popularity as an attempt to address the problem of fabric waste. Zero-waste garments are designed to use 100% of the fabric and leave no waste. Researchers have explored different zero-waste design methods and the roles of the designer, pattern maker, and marker maker in this new development process; however, no studies have looked at how zero-waste garments may be graded into a full size range which would be necessary to meet consumer expectations of fit and therefore move zero-waste towards feasibility. In order to determine ways to evaluate the feasibility of grading zero-waste garments, current practices and research in zero-waste fashion design, apparel grading and marker making must be reviewed and evaluated.

2.1 History of Zero-Waste Fashion Design

Throughout history we can find examples of garments designed and cut to use a full width of fabric. In fact, pieces of cloth became clothing on their own, and for most of human history it was standard practice to create garments from rectangular pieces of fabric draped over the body and pinned or anchored with accessories. Fabric was a labor intensive, scarce resource that was highly valuable, and it would have been reckless to waste it or throw it out. Uncut, rectangular pieces of fabric would have been folded and wrapped around the body, usually resting on or beginning either from the shoulders or from the waist (Lindqvist, 2013). Different versions of rectangular wrapped garments can be found in many cultures from all over the world, with variations in the types and amount of wrapping determined by the width of the looms available in that culture and therefore the dimensions of fabric available (Burnham, 1973). Richard Lindqvist demonstrates how garments can be cut from a single piece of cloth, often starting with a single rectangular piece of fabric and wrapping it around the body as garments were historically created. He trims fabric away during wrapping to create new shapes that are fitted to the body (Lindqvist, 2013).

Early Greece has several examples of this rectangle based wrap garment. The peplos, himation, and chiton were all rectangular lengths of fabric that were not cut or stitched. The chiton was a tunic that fastened at the shoulders and was used as a base garment (Stears, 2006). The peplos and himation were large pieces of fabric draped and folded, often elaborately, over the chiton and around the body. The amount of fabric, as well as the color of the fabric, would have indicated social status, occupation, and/or wealth (Stears, 2006).

The sari of South Asia is another example of a wrap garment with no fabric cutting (Rissanen, 2008). A sari generally means, “*any draped untailored textile of about five meters in length, worn by the women of South Asia*” (Steele, 2005, p.138). The sari is wrapped around the body, usually along with two stitched garments underneath the wrapped length of fabric. There are around one hundred ways to wrap a sari in India alone (Steele, 2005).

The kimono of Japan also wastes no fabric in its construction. The pattern pieces that make a kimono are simple rectangles that interlock so that all of the fabric is utilized and folds replace straight seams (Rissanen, 2008). The size of the kimono is essentially one-size fits all and the fit is adjusted for the wearer by tying on a belt (Rissanen, 2008)

Historical methods of garment construction have informed current zero-waste design practice. Methods of wrapping and draping full lengths of fabric are still used today. Geometric shapes like the rectangles that make the kimono are still used to make interlocking pattern pieces; though the complexity of the shapes may have increased in modern practice.

2.2 Current Practice in Zero-waste Fashion Design

The modern interpretation of zero-waste garment design comes from a sustainable point of view; it focuses on improving the sustainability of the apparel product development and production process by reducing the amount of fabric waste that goes to the landfill at the pre-consumer stage of a garment. Rissanen (2013, p.2) defines a zero-waste garment as “a garment that has been designed and pattern cut in such a way that when the garment is cut, all of the fabric is in the garment, and none is left behind as off-cut waste.” The study of zero-waste design has been pioneered by a small group of academic researchers and industry leaders; primarily led by Timo Rissanen of Parsons School of Design, The New School in New York

City and Holly McQuillan of Massey University in New Zealand. Rissanen and McQuillan each began working on the problem of zero-waste fashion design independently at around the same time in 2005. They have co-authored two books about zero-waste fashion design and they co-curated the *Yield: Making Fashion Without Making Waste* exhibition in 2011 that highlighted the work of zero-waste designers from the last several decades; many of which are highlighted later in this chapter. Both Rissanen and McQuillan place emphasis on the role of the designer and the role of the pattern maker being integrated into one role or person. They assert that successful zero-waste fashion design requires that pattern cutting must be a design consideration at the beginning of the design process. Ideally the designer of a zero-waste garment is also the pattern cutter; or the tasks be completed simultaneously and in close communication with one another (McQuillan, 2011; Rissanen, 2013). While the two researchers have similar outlooks on dealing with the problem of fabric waste in the development stage of a garment, they bring varied methods to the actual practice of zero-waste fashion design. McQuillan describes three methods of zero-waste garment design: jigsaw, embedded jigsaw, and tessellation (McQuillan, 2011). Researchers Melanie Carrico and Victoria Kim add a 4th method, called minimal cut (2014). The 4 methods are described in the following sections.

2.3 Jigsaw Method

McQuillan describes the jigsaw method, which is a method that Rissanen is well known for using to eliminate fabric waste. Jigsaw refers to the way all pieces of the garment interlock with each other in the marker and generate no fabric waste from their production (McQuillan, 2011; Rissanen, 2013). The kimono is a very simple historical example of a jigsaw garment because it is cut from rectangles that interlock to all of the fabric in the marker. Jigsaw design

builds off of the subtraction cutting method developed by Julian Roberts and uses his “plug technique” that says that any shape can be inserted into any void so long as the diameter of both are the same (McQullan, 2011, Roberts, 2013). This means that each cut in the fabric is the edge of two pattern pieces rather than one. The resulting marker looks like a puzzle whose pieces fit together perfectly leaving no unused fabric to be cut away (see **Figure 1**). Katherine Townsend describes a study in which a designer re-designs a non-zero-waste garment into a jigsaw zero-waste garment as a framework for exploring a creative cutting process (Townsend, 2013).

In this method the width of fabric becomes a fundamental design parameter (Rissanen, 2008) and is usually the starting point of the jigsaw design process. The designer must be aware of the fabric width because garment pieces must fit perfectly into the full width of the fabric for there to be no fabric waste. If the width of the fabric is changed then the shapes of the garment pieces must be adjusted or completely redesigned, which likely changes the aesthetic of the garment. For example, if a narrower width of fabric were used then the pattern pieces would overlap and portions of each piece would be lost. If a wider piece of fabric were used, then there would be gaps of unused fabric between the pattern pieces, which would create fabric waste.

T-Shirt 4006: Hoodie in stripe interlock knit.

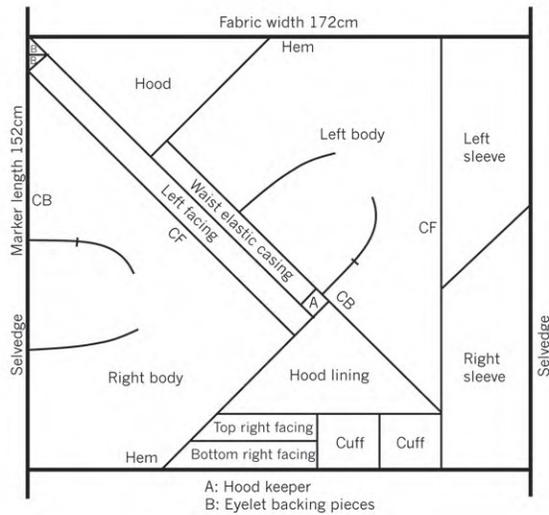


Figure 1 Jigsaw marker and garment from *Zero-waste fashion design: a study at the intersection of cloth, fashion design, and pattern cutting* by Timo Rissanen, 2013, p. 223.

The fabric width parameter and maintaining the interlocking of the pieces are the primary limitations of the jigsaw method when considering grading the garment into a full size range. Changing the shape of the garment pieces in the way that traditional grading dictates, would create gaps and overlaps between pieces so that they no longer interlock because grading does not change the shape of a pieces proportionally; rather it moves the perimeter of the pattern in a way that corresponds to body growth, which is rarely proportional. Changing the dimensions of the garment pieces for grading would also result in either under utilizing the fabric or exceeding the width of the fabric.

2.3 Embedded Jigsaw Method

McQuillan also uses the jigsaw design method; however, she has expanded the practice using the embedded jigsaw method, which “embeds a traditionally designed garment pattern into a zero-waste pattern and treats the embedded pattern as a fixed area. This enables multiple garment designs and types from a single zero-waste pattern” (McQuillan, 2011, p. 93). The designer may cut different garment styles from the same piece of cloth using this technique.

Figure 2 shows an embedded jigsaw zero-waste marker for a hoodie and a t-shirt.

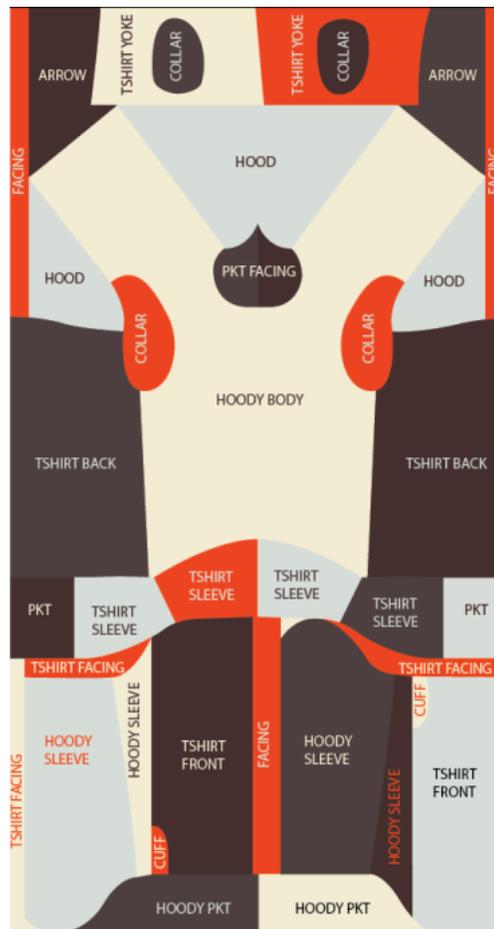


Figure 2 Embedded zero-waste hoodie and Tshirt By Holly McQuillan, retrieved from <http://hollymcquillan.com/design-practice/twinset-embedded-zero-waste/#jp-carousel-597>. Copyright Holly McQuillan.

2.4 Tessellation Method

Tessellation is another method that Holly McQuillan uses to create zero-waste garments. A tessellated pattern is “one shape that repeats by fitting perfectly together, with no gaps between the shapes” (Carrico & Kim, 2014). The shapes are cut out of the fabric into pieces that are arranged and overlapped on the body to form a garment (see **Figure 3**). The arrangement of the pieces can be shaped to necklines and armholes and can be removed and rearranged to produce an almost infinite number of possible garment designs (McQuillan, 2011).



Figure 3 Tessellation garment pinned to dress form from “Zero-waste design: strategies and risk taking for garment design.” By Holly McQuillan, p. 90-91, 2011.

Simple geometric shapes with straight edges that line up with the grain of the fabric may be repeated in a way that creates no fabric waste at the selvedge; however, more complicated tessellated shapes are less likely to neatly fill all of the fabric. McQuillan has compensated for this by using “hyperbolic tessellation,” which varies the scale of the tessellated shape so that

smaller pieces are placed at the selvedge and use more of the fabric (McQuillan, 2011). Even so, there are small gaps in this layout that prevent it from being truly zero-waste, as pictured in

Figure 4. The wasted fabric appears along the edge of the selvedge.

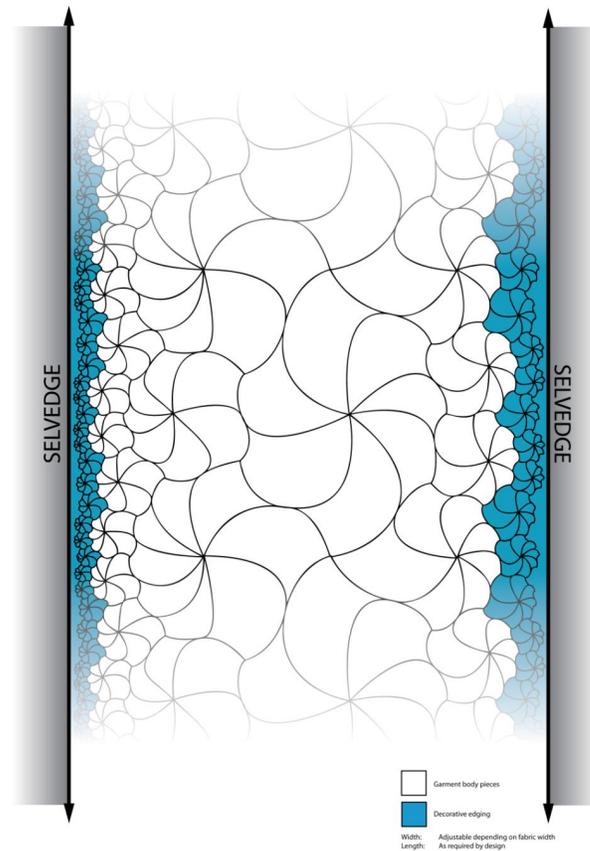


Figure 4 Tesselation marker design from “Zero-waste design: strategies and risk taking for garment design.” By Holly McQuillan, p. 88, 2011

The amorphous nature of a tessellation patterned garment may work to fit a larger size range than if the pieces of the garment were not movable. Changing the size of the garment may be achieved through rearranging the way the tessellation patterns are assembled on the body, giving extra space in the garment by moving the individual pieces away from each other or closer to each other as needed. This would mean that the garment is essentially redesigned for

each size since the placement of the pieces would vary for each size. While this method of garment sizing may work for customizing garments for individuals, it would be difficult to mass produce because the design of the actual garment would fall to the wearer.

2.5 Minimal Cut Method

Another zero-waste method proposed by Melanie Carrico and Victoria Kim (2014) is called minimal cut. It is a hybrid of draping and the jigsaw method. Fewer cuts are made into the fabric with most of the garment shape coming from slashes in the fabric rather than separate tailored pieces (see **Figure 5**); the excess fabric is draped about the body (Carrico & Kim, 2014). According to the creators of the method, “the minimal cut practice leaves the whole cloth more intact than jigsaw or tessellation methods, and it employs draping to a greater level for design development” (Carrico & Kim, 2014, p.62).



Figure 5 Zero-waste dress and marker created using minimal cut method from “Expanding zero-waste design practices: a discussion paper,” by Melanie Carrico and Victoria Kim, p. 62.

2.6 Zero-Waste Fashion in the Market

There are several designers in the apparel market who are practicing zero-waste fashion design. Some brands embrace zero-waste practice completely and development and production of their garments sends absolutely no waste to the landfill; however, most examples of zero-waste garments are just one component of collections that use many sustainable practices and materials for an overall sustainable identity. Looking at how designers and brands are currently using zero-waste fashion design to create marketable collections can indicate the manufacturability of zero-waste garments, with a particular emphasis on how they have handled creating and selling multiple sizes of zero-waste garments.

Mark Liu is a graduate of Central St. Martins who has explored many new ways to approach zero-waste fashion design. He employs a technique that uses the excess fabric that would form the seam allowance on the outside of the garment so that it creates a decorative applique effect; as well as screen-printing to transfer his garment patterns to the fabric so that the edges of the fabric do not fray (Rissanen, 2008).

Zandra Rhodes is an English designer who creates zero waste garments that are influenced by digital textile prints. First, she develops the textile print, which determines the shape of the garment (Rissanen, 2008). Her garments do not use selvedge; which prevents some of her designs from truly being zero-waste (Rissanen, 2008). Her “Chinese Squares” dress that was included in the *Yield: Making Fashion Without Making Waste* exhibition is an example of her zero-waste method (see **Figure 7**).



Figure 6 Zero-waste garment and pattern pieces showing how the seam allowances are used as embellishment. From “Mark Liu’s Zero-Waste Designs Use Every Last Scrap,” by Y.Yoneda, 2009, *ecouterre*, retrieved from <http://www.ecouterre.com/mark-lius-zero-waste-designs-use-every-last-scrap/>.

It is cut along a square block repeat and draped, gathered, and tied on the body to create a fitted silhouette. The pattern pieces are cut around the textile print so that the print is not disturbed (McQuillan, 2011). Rissanen describes the grading method for this garment:

The square sleeve pieces with circular center cutouts do not grade, except for the two cutouts that attach to armholes. The vertical length of the largest-size bodice is the same as the one size smaller, so that the pattern fits on the fabric width. The body and peplums are cut on the weft grain, perpendicular rather than parallel to selvage, to allow conventional horizontal grading (2008, p.200).

Yeohlee Teng has been making minimal waste clothing since the 1980s. Her 2009 collection wasted no fabric, and highlighted the pattern cutting aspect of the collection by including flat outlines of the pattern pieces used to make the garments on the runway and laying the garments over the outlines (Rissanen, 2013).



Figure 7 Silk Crepe de Chine Wrap Dress, ‘Chinese Squares’ Chinese Collection Spring/Summer, 1980, Collection of the San Diego History Center, Copyright Zandra Rhodes.

Such a display strongly illustrates the importance of pattern cutting to her zero-waste design process. In her 2003 book, *Yeohlee: Work*, she describes the influence fabric waste has on her work:

I work with luxurious fabrics, and I feel that when you have the privilege of working with expensive, beautiful fabrics you should do your utmost to conserve them and not be wasteful. When you can make a complete coat out of a single rectangle of fabric it's very efficient. Of course, there are some patterns that don't fit into a rectangle and then you have waste. It sounds a little obsessive to think that way but I try to be neat and orderly, without losing any of the emotional content of the clothes. Another aspect of this is that I try to utilize the cloth from selvedge to selvedge. Most people cut the selvedge off but you know I see its beauty and I retain it and I use it as part of the design of the garment (p. 141).

Yeohlee deals with garment sizing in a one-size fits all approach as part of her initial design process. She says, “The most efficient way to work is to design one size fits all, because you can just stack them all up and cut them at once” (Yeohlee & Antonelli, 2003, p.140)

A number of established apparel brands are experimenting with zero-waste fashion design. In 2010, The North Face and Textiles Environment Design (TED) collaborated with menswear designer David Telfer to design a zero-waste down jacket (Gwilt, 2014). His jigsaw zero-waste jacket improved the fabric utilization by 23.2% compared to The North Face’s traditional down jacket (Zero-Waste Design, 2010). The jacket was exhibited at a VF conference and the *Yield: Making Fashion Without Making Waste* exhibition (“Zero-Waste Design,” 2010); however, it does not appear to have been manufactured by The North Face (see Figure 8).

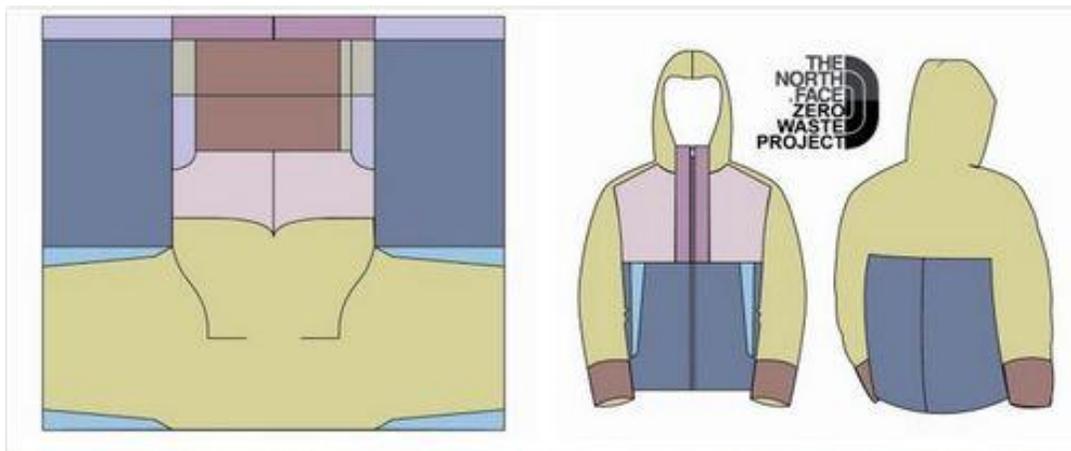


Figure 8 Zero-waste down jacket by David Telfer. From *Zero Waste Design, 2010 – Yield Exhibition*. (n.d.). Retrieved October 15, 2016, from David Telfer: <http://www.davidtelfer.co.uk/page2.htm>

Loomstate collaborated with Parsons The New School for Design for students to design a zero-waste garment for production. The winning zero-waste garment was an anorak designed by Andria Crescioni (see **Figure 9**). It was manufactured in limited quantity and sold at

Loomstate.org and ROGAN boutique (The New School, 2011). It is sized as “one size fits most” (Lanks, 2012).



Figure 9 Zero-waste anorak for Loomstate by Andria Crescioni, retrieved from <http://www.fastcodesign.com/1668942/loomstate-to-parsons-students-design-a-zero-waste-garment-and-well-make-it>

2.7 Current Industry Practices in Pattern Grading

Most current research in grading compares traditional grading methods and fit (Bye, LaBat, McKinney, & Dong-Eun, 2008) and concludes that current practices in grading do not result in satisfactory fit for consumers (Schofield & LaBat, 2005; Newcomb & Istook, 2004). Some studies go on to compare the fit of different sizing systems (Petrova & Ashdown, 2012). There is also research on the ways that computer aided design technology and 3D models can be used to improve the efficiency and accuracy of grading (Abu Sada Muhammad, Kennon, & Clarke, 2014; Goksel, Utkun, & Ondogan, 2012; Hlaing, Kryzywinski, & Roedel, 2013). From the current research it is clear that there is an opportunity to explore new methods of grading garments that have not traditionally been used by industry in order to satisfy the fit

requirements of the consumer. There are currently no studies that look at methods of grading zero-waste garments.

Schofield (2007) defines grading as the process used by clothing manufacturers to product patterns for a garment in a range of sizes for ready-to-wear clothing, and Bye (1990) describes it as the process of increasing or decreasing the base size pattern according to a set of body measurements and proportional relationships to develop a range of sizes for production. The earliest grading systems for women's clothing were the proportional dressmaker's systems developed between 1820 and 1840 (Schofield, 2007; Kidwell, 1979). Grading is usually completed by the pattern maker or a grader and requires skilled persons with an extensive knowledge of garment patterns and an understanding of the expected changes for all sizes in the range (Schofield, 2007).

Grading starts with a base size that has been perfected on either a human fit model or a dress form in a base size. The base size should reflect the desired dimensions or proportions of the target market and it is usually in the middle of the size run (Schofield, 2007). Seam lines should be *trued*, or made the same length so that they match when they are sewn together, and the corners of joining seams should match and create a smooth line when joined (Schofield, 2007), usually accomplished by squaring corners. Next, sizes and increments for each size must be determined based on the size specifications. Size specifications are lists of the critical measurements needed to maintain the fit and style of a garment across sizes (Ashdown, Lyman-Clarke, Smith, & Loker, 2007). Size specifications are created by the pattern maker from a base garment, and the measurements of the garment are adjusted for larger and smaller sizes based on the increments between sizes at specific points on the garment, called cardinal points or grade

points. Size specifications are also used to maintain fit during sampling and production with the manufacturer. If the garment is sewn correctly then it will meet the specifications (Ashdown, et. al., 2007).

Schofield describes three techniques of grading:

1. **Manual:** The manual technique is historically the most common used for grading (Schofield, 2007). The “grading information is expressed as the distance and direction to move the pattern from one cardinal point to the find the next cardinal point” (Schofield, 2007). It can be used on a flat table or using a manual grading machine (Schofield, 2007).
2. **Proportional:** The proportional technique begins with base size that is graded up to the largest size and down to the smallest size in the size range. Then, a diagonal line is drawn from each cardinal point of the base size directly to the corresponding cardinal points on the largest size. The diagonal line is divided by the number of sizes between the base size and the largest size. Each new pattern piece is drawn from point to point on the diagonal lines (Schofield, 2007). This method is not widely used in the industry (Schofield, 2007).
3. **Edge changes:** The edge changes technique uses grade rules that are assigned to each cardinal point that define the precise increase or decrease in both horizontal and vertical directions from the base size. Standard grade rules allow consistent proportion between sizes in a size run. The edge changes method is the method used in CAD systems for grading (Schofield, 2007).

The resulting graded patterns are arranged one within the other, lined up at the zero point on one piece of paper to form a nested grade (Schofield, 2007). The cardinal points should be evenly spaced and the curved seam lines should follow the same approximate shape and straight lines parallel to each other (Schofield, 2007). The nested grade can quickly be visually evaluated for accuracy based on the following criteria for a well-made pattern (Schofield, 2007):

1. The same relationships exist between front and back pattern pieces and the same proportions and pattern shapes exist for all pattern sizes.
2. Seams maintain the same relationship to the grain, which helps seams lie flat and not skew.
3. Grade rules are based on measurement data from a representative target market, graded pattern must be evaluated on representative fit models or realistic dress forms in each size

2.8 Current Industry Practices in Marker Making

Most of the existing research involving marker making looks at algorithms for CAD that aid in optimizing fabric utilization and reducing cost related to marker making (Wong & Leung, 2009). There is research that examines the relationships between the tasks of designing, pattern making, and marker making for zero-waste garments and conclude that zero-waste fashion design requires that garment design, pattern making and marker making occur concurrently (Rissanen, 2013); however, there are no studies that include making markers with multiple sizes of one garment style that waste no fabric.

Traditionally, after a pattern is graded a marker is made by a marker maker. The marker maker's goal is to find a layout that has the most efficient use of fabric (Ashdown, et. al.,

2007). The marker maker may make changes to the pattern piece, like decreasing seam allowances, changing the grain line or splitting pieces, so that it fits into the marker more efficiently and decreases fabric waste. Changes to the pattern change aesthetics and fit of the garment, so the marker maker must work closely with both the pattern maker and the designer of the garment to ensure the look and fit is not compromised (Ashdown, et. al., 2007). Changes to the pattern pieces for fabric usage must also be time efficient. Splitting pieces may improve the way the pieces fit on the fabric but it may also add too much time during the sewing process and result in increasing the overall cost (Ashdown, et. al., 2007). Overall, there has been little to no research on grading zero-waste garments.

In conclusion, industry's growing interest in sustainability is an opportunity for zero-waste fashion design to be utilized in manufacturing. While the current research examines methods of zero-waste design and development processes, these methods do not include grading zero-waste garments into full size ranges that would be necessary to satisfy consumer expectations in the market.

Chapter 3: Methodology

3.1 Research Purpose

The primary goal of this research was to evaluate the feasibility of grading a zero-waste garment using two different methods of grading: conventional grading and varying widths of fabric. The fabric utilization, fit, and design integrity was evaluated in three different sizes for each grading method in order to compare how each method might meet industry expectations for fabric waste, fit, and design integrity. Size 4 (garment 2) and size 12 (garment 3) were selected because they were both two size steps away from the base size 8 garment; which allowed a consistent range of fit between sizes as well as enough movement away from the base size 8 to show a meaningful difference in fit.

This study was set up as a pilot study to determine the feasibility of the research. A comparative analysis mixed methods design was used. Quantitative data related to fabric utilization in the markers for each grading method was gathered and compared. Qualitative data was used to analyze the fit and design integrity of the garment produced by each grading method tested. The rationale of this mixed methods approach is that the quantitative data measured whether or not each grading method met the zero fabric waste criteria, while the qualitative data was used to measure how closely the design resembled the original control garment as well as measure how well each garment fit on the corresponding dress form for each size.

The first objective of this pilot study was to test the fabric utilization of two methods of pattern grading for a zero-waste garment: conventional grading and using varying widths of fabric for each size. Patterns and markers were created for each method and the percentage of fabric waste in each marker was measured using Gerber Accumark Easy Marking CAD

software. The resulting data was compared to the control marker that had zero fabric waste. The second objective was to analyze the fit and design integrity of the garments constructed from each grading method. A small team of expert evaluators used a standard adapted fit survey (see Appendix C) to evaluate characteristics of fit and design for each size and comparative evaluation was used to analyze the ratings.

The data of the quantitative and qualitative phases were evaluated independently with equal weight placed on each phase. The results of the two phases were integrated in the discussion of the study, which were used to make recommendations on how zero-waste garments may be graded for mass production that could be adopted by the fashion industry.

3.2 Research Questions

This pilot study was framed by three main research questions:

1. Can zero-waste garments be graded without creating fabric waste?
2. Do graded zero-waste garments meet industry expectations for fit?
3. Do graded zero-waste garments meet industry expectations for design integrity?

3.3 Design of study

The pilot study aims to answer the main research questions by focusing on two objectives: (1) measure and compare the fabric utilization of two selected zero-waste grading methods, and (2) evaluate the fit and design integrity of the selected grading methods.

3.3.1 Re-designing the Zero-Waste Garment.

A study of the relevant literature had revealed an example (Townsend, 2013) in which a student re-designed a conventional, non-zero waste garment into a zero-waste

garment. Following this example, the researcher began by redesigning a size 8 non-zero waste garment (control) into a size 8 jigsaw zero-waste garment (garment 1).

Using simple geometric shapes, such as triangles and rectangles, which interlocked easily with each other, all the pattern pieces were converted into either rectangles or triangles that locked together. This was done by removing as many curves from the pattern pieces as possible and making each piece a simple geometric shape; however, removing the curves in the pattern pieces resulted in losing some of the shaping that made the garment fit closely to the body. The resulting rectangles and triangles still created some negative space once they were locked together in the marker, so that negative space was used to make rectangular bindings and a band around the hem, as well as triangular zipper facings and pockets.

The A-line skirt of the control garment was changed to a rectangular piece that fit the full width of the fabric (see Appendix A, Figure 3). The extra fabric in the skirt created by this change was gathered to the width of the waistband, which gave the skirt much more fullness than the control garment and changed the silhouette of the dress.

Pockets were added to the design in order to keep the curve at the center front of the waist for shaping. The curved sections of the waistband interlocked with the corners of the front skirt, creating dips in the skirt pattern at each corner, which became the pockets. Triangles created from the negative space of the bodice front and back were pieced together to form the pocket bag and pocket facing. The finished size 8 jigsaw zero-waste marker had a 99.93% fabric utilization, which means 0.07% of the fabric in the marker is wasted. When the marker was cut by the Lectra cutter, the machine did not recognize the very small gaps between the pattern

pieces and interpreted the two edges of each piece as one cut; therefore there was 100% utilization in the physical cutting of the fabric

3.3.2 Objective 1: Fabric Utilization

The quantitative phase of the study was an experimental design. The independent variables of this phase of the study were the methods used to grade the garment: conventional grading, and varying widths of the fabric. The grading methods were chosen by the researcher according to the literature review. The dependent variable was the amount of fabric in the marker for each grading method that was not included in the garment (fabric utilization percentage).

All base patterns, graded patterns, and markers were created manually by the researcher using Gerber Accumark 10 computer-aided design software. The style and size of the garment that was graded was controlled across all grading methods. The base garment used in the study was a misses size 8 dress that the researcher designed and pattern drafted using the jigsaw zero-waste design method. The base garment utilized 100% of the fabric in the marker. A fabric width of 38” was used for the base size. All garments were constructed using muslin fabric. The base garment was graded to two sizes; up to a missy size 12 and down to a missy size 4 for each variable grading method.

Grading Method #1: Conventional Grading

The base size 8 garment was graded using the edge changes conventional grading method that is most often used with CAD pattern making systems. Edge changes grading is accomplished by assigning grade rules to each cardinal point that defines the precise increase or decrease in both horizontal and vertical directions from the base size.

Grade rules were assigned to each cardinal point on each piece of the base size 8 garment (Figure 10). Grade rules were not assigned to the pattern pieces that were created from negative space (see Figure 10). The growth increments for the size 4 and size 12 grade rules used in this study were based on the growth increments of the Alvanon missy dress forms and the ASTM misses size standard (see appendix B).

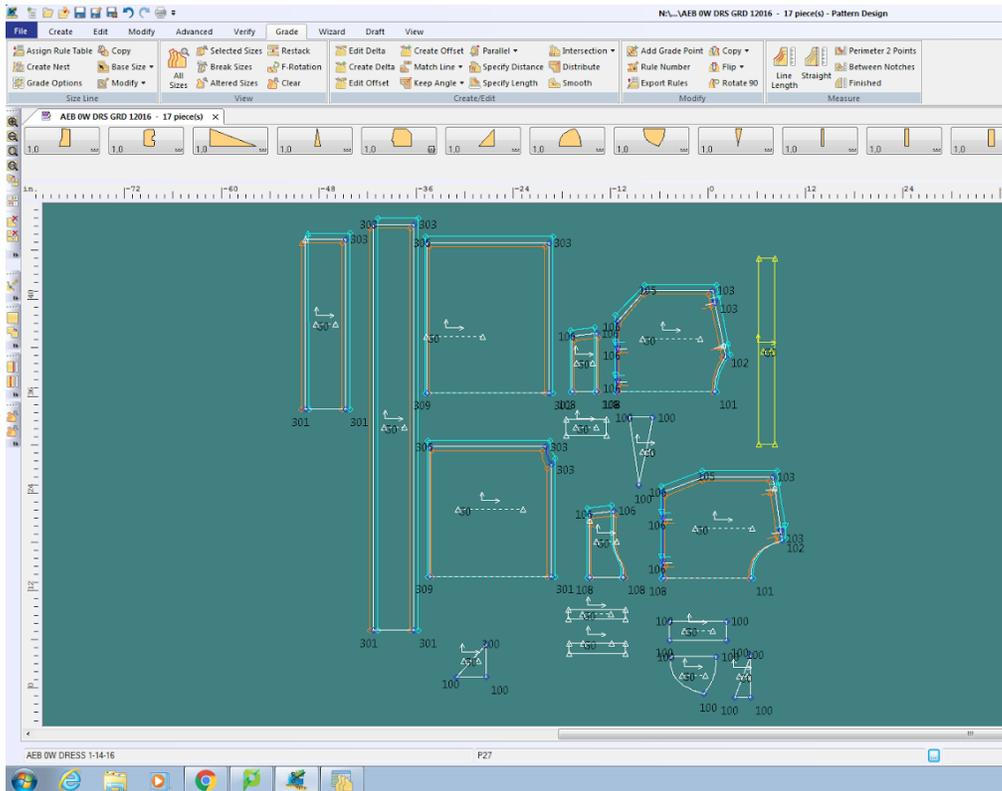


Figure 10 Base size 8 pattern pieces with grade rules assigned to cardinal points, and size 4 and size 12 graded pattern pieces. Size 4 is shown in orange, size 8 is shown in white, and size 12 is shown in blue.

A marker was created for the size 4 and size 8 garments individually. The data for the percentage of fabric waste in the size 4 and size 8 markers was gathered using Gerber AccuMark Easy Marking software.

A limitation of the conventional grading method is that moving the cardinal points in standard increments changes the shape of the pattern pieces in a way that prevents them from interlocking as the base size does, which creates fabric waste.

Grading Method #2: Varying Widths of Fabric

Using varied widths of fabric is a possible grading method for zero-waste garments because fabric width is a primary limitation of zero-waste design (Rissanen, 2008). By increasing or decreasing the width of the fabric, the dimensions of the garment pieces can also be increased or decreased.

The researcher chose three fabric widths, 36", 38", and 44", based on the available widths of muslin fabric at retail. Markers were created for the size 4 garment by scaling down the entire size 8 jigsaw marker proportionally so that it was changed from 38" wide to 36" wide.

Markers were created for the size 12 garment in the same way that was used to create the size 4 markers. The entire size 8 jigsaw marker was proportionally scaled up so that it was changed from 38" wide to 44" wide.

The greatest limitation of grading method #2 is the lack of availability of varying fabric widths. The fabric most readily available to the researcher in a consistent weight, hand, and color but in different widths was muslin. Muslin is available in widths of 36", 38", 43", 44", 60", 90", 108", 119". The researcher chose widths of 36", 38", and 44" because they were the narrowest widths available and they had the smallest differences in widths between them.

3.3.3 Objective 2: Fit and design integrity

The qualitative phase of the study compared the fit and design integrity of the graded size 4 and size 12 garments from each of the two grading methods in the quantitative phase to the fit and design of the base size 8 zero-waste garment. Three experts in the field of apparel and fit were asked to rate characteristics related to the fit and design integrity of the graded garments using a Likert-type scale (see Appendix C).

Garments were constructed in muslin fabric from the graded pattern pieces and markers from each grading method in the previous quantitative phase of the study. A Lectra cutter was used to cut the fabric and a Juki lockstitch sewing machine was used for seaming. White polyester cotton thread was used for stitching and a 20” invisible zipper was used in the side seam. The edges of the garments were finished with either an overedge stitch (side seams and waistband), binding (neckline and zipper), or roll hem (skirt hem and sleeve hem).

One size 4 and one size 12 garment was constructed from the conventionally graded pattern pieces. One size 4 and one size 12 garment was constructed from the markers made with varied fabric widths.

First, the size 8 non-zero waste garment (control garment) and the size 8 zero-waste base garment (garment 1) were both placed on a size 8 Alvanon dress form and visually evaluated in person by three individuals with fitting expertise. Each individual was asked to give the following fit characteristics a numerical rating on a likert-like scale in an excel spreadsheet: shoulder seams, side seams, waistband, gathers, skirt length, fullness, neck hole, arm hole, and overall fit. Each characteristic was rated either: 1 - very poor, 2 - poor, 3 - fair, 4 - good or 5 - very good. The following design characteristics were also rated on a Likert-type

scale: silhouette, line, proportion, and overall design; (Likert-type scale survey can be found in Appendix C.) After the size 8, non-zero waste garment was evaluated, then the size 4 and size 12 garments from the conventionally grading method (garment 1 and garment 2) were placed on a size 4 Alvanon dress form and a size 12 PGM dress form, respectively, and evaluated by the same three individuals using the same likert-type scale surveys as the base size 8 control garment. The same process was repeated with the size 4 and size 12 garments graded using the varying widths of fabric method (garment 4 and garment 5).

3.4 Data Analysis

Quantitative data from the first phase of the study was charted according to grading method, size and percentage of fabric waste. For this study, any marker that achieved at least 99% utilization is considered zero waste. For comparison, the industry norm is 85% (Cooklin, 1997).

Qualitative data from a Likert-type scale in the second phase of the study was evaluated by adding up the total numerical score for each grading method and size and comparing the scores of each method. Separate Likert-type scales were created for fit and for design integrity. Grading methods with the lowest fit scores were considered to have the worst fit and grading methods with the highest fit scores were considered to have the best fit. Similarly, grading methods with the lowest design integrity scores were considered to have the least design integrity and methods with the highest design integrity were considered to have the most successful design integrity.

Chapter 4: Results

The goal of this pilot study was to evaluate the feasibility of grading a zero-waste garment using two different methods: conventional grading and varying widths of fabric. The first objective was to measure the fabric waste created by the two grading methods. Using Gerber Easy Mark CAD software, markers were created for the control garment, the base jigsaw garment (garment 1), a size 4 (garment 2) and a size 12 (garment 3) conventionally graded garment, and a size 4 (garment 4) and size 12 (garment 5) garment graded using varying widths of fabric. The fabric utilization of each marker was measured by the software and quantitative data was collected. The second objective was to evaluate the fit and design integrity of the two grading methods. Garments were constructed from each marker made in objective one and qualitative data was collected from three experts who evaluated the garments using specific fit and design parameters on a Likert-type scale.

4.1 Objective 1: Fabric Utilization

The first objective of the pilot study was to test the fabric utilization of two methods of pattern grading for a zero-waste garment. These methods were conventional grading and varying widths of fabric adapted from Rissanen (2008). Before the grading could take place the control garment needed to be re-designed as a zero-waste garment in a size 8 (garment one). It was used to compare the amount of fabric waste in a non-zero waste garment, first to its redesign as a zero-waste garment (garment one), and then to the graded zero-waste garments.

Six markers were created and the fabric utilization percentage of each marker was measured using Accumark Gerber Easy Marking software. The fabric utilization percentages were ranked from highest fabric utilization to lowest fabric utilization. (see **Table 2**).

4.1.1 Sample

Markers for the following garments were created (see **Table 1**).

Table 1 *Grading Methods and Sizes of Markers*

	Grading Method	Size
Control	Non-zero waste garment	8
Garment 1	Re-designed	8
Garment 2	Conventional grading	4
Garment 3	Conventional grading	12
Garment 4	Varying widths of fabric	4
Garment 5	Varying widths of fabric	12

Control Garment

A simple dress was used as a basis for the study. It was an original design by the researcher and was chosen because it had a simple construction and the shapes of the pattern pieces lend themselves to becoming geometric.

The marker for the control garment was 38” wide and used 62.28% of the fabric in the marker. In comparison to the industry norm, this is about 20% less fabric utilization due to the layout of the bias strip; however, this is the normal layout of the production of this garment (see **Figure 11**).

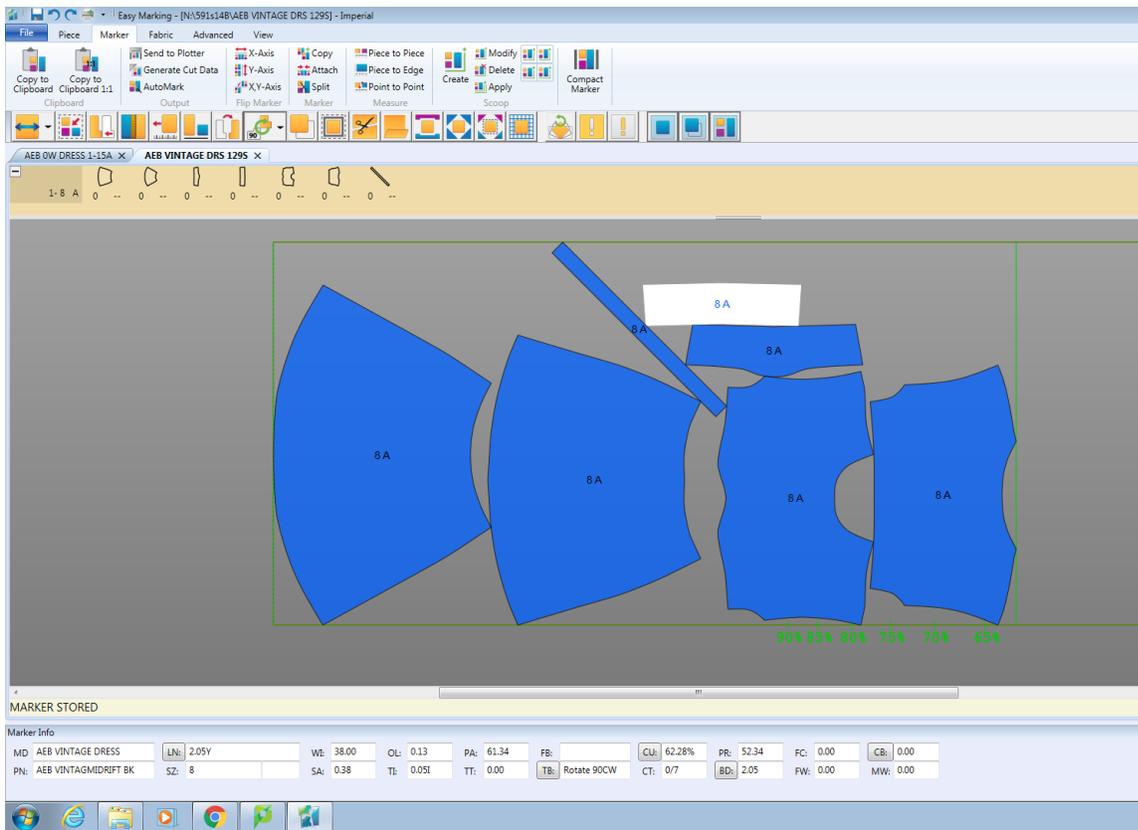


Figure 11 Marker for the control garment, size 8 non-zero-waste garment

Redesigned Zero-waste Garment (garment #1)

The control garment was re-designed using Rissanen’s jigsaw method (2008) so that the pieces interlock leaving zero fabric wasted in the marker. The marker for garment 1 was 38” wide and used 99.93% of the fabric in the marker (see **Figure 12**).

Conventional Grading Method (Garments Two and Three)

Garments two and three (size 4 and 12 of the jigsaw design method) were graded by assigning grade rules to the cardinal points on the base size 8 zero-waste garment and using the grade tool in the Gerber Accumark system which resized the pieces down to a size 4 and up to a size 12 using a missy rule table (see Appendix B).

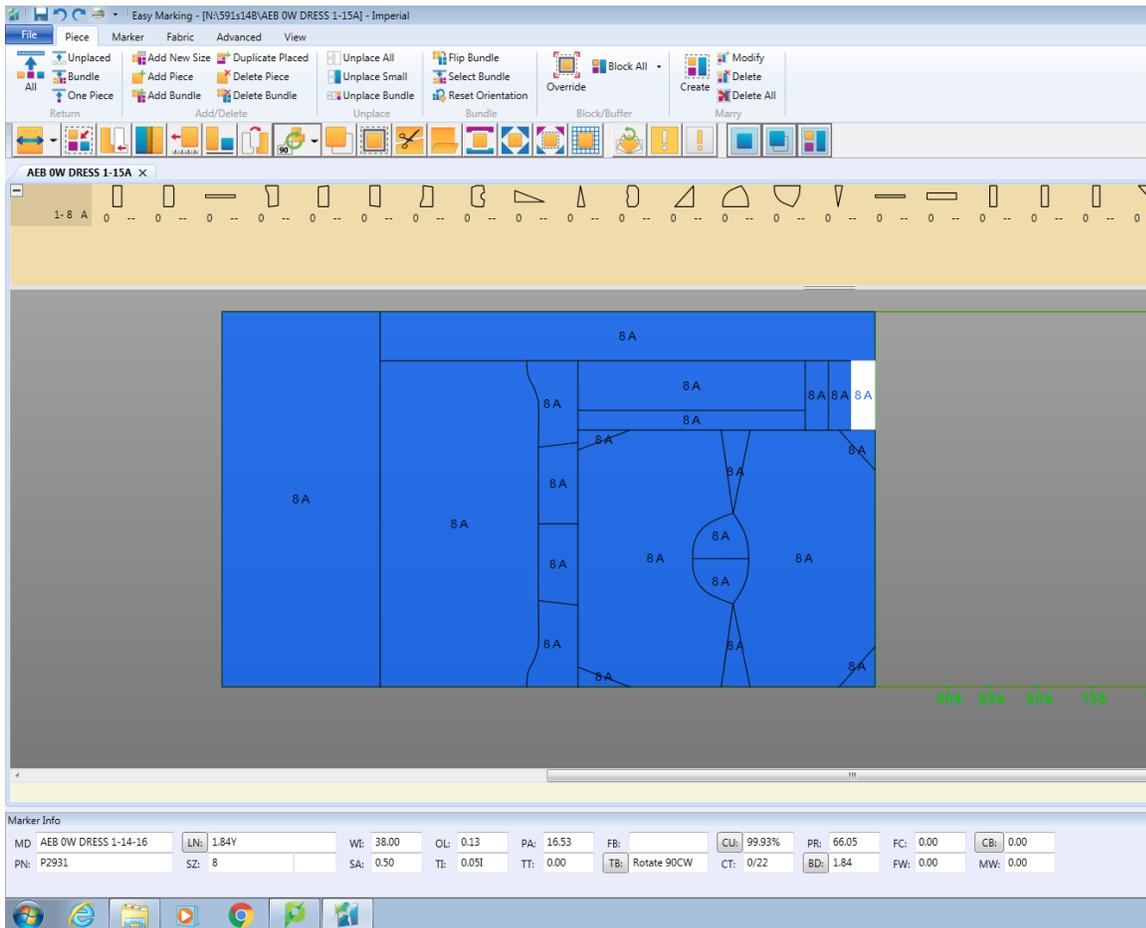


Figure 12 Marker for garment 1, size 8 redesigned zero-waste garment

Conventional Grading Method (Garments Two and Three)

Garments 2 and 3 (size 4 and 12 of the jigsaw design method) were graded by assigning grade rules to the cardinal points on the base size 8 zero-waste garment and using the grade tool in the Gerber Accumark system which resized the pieces down to a size 4 and up to a size 12 using a missy rule table (see Appendix B). These grade rules were developed by the researcher to confirm as closely as possible to the current ASTM body measurement standard.

The marker for garment 2 was 38” wide and used 95.66% of the fabric in the marker.

This is 10% better fabric utilization than the industry norm of 85% (Cooklin, 1997) (see **Figure 13**).

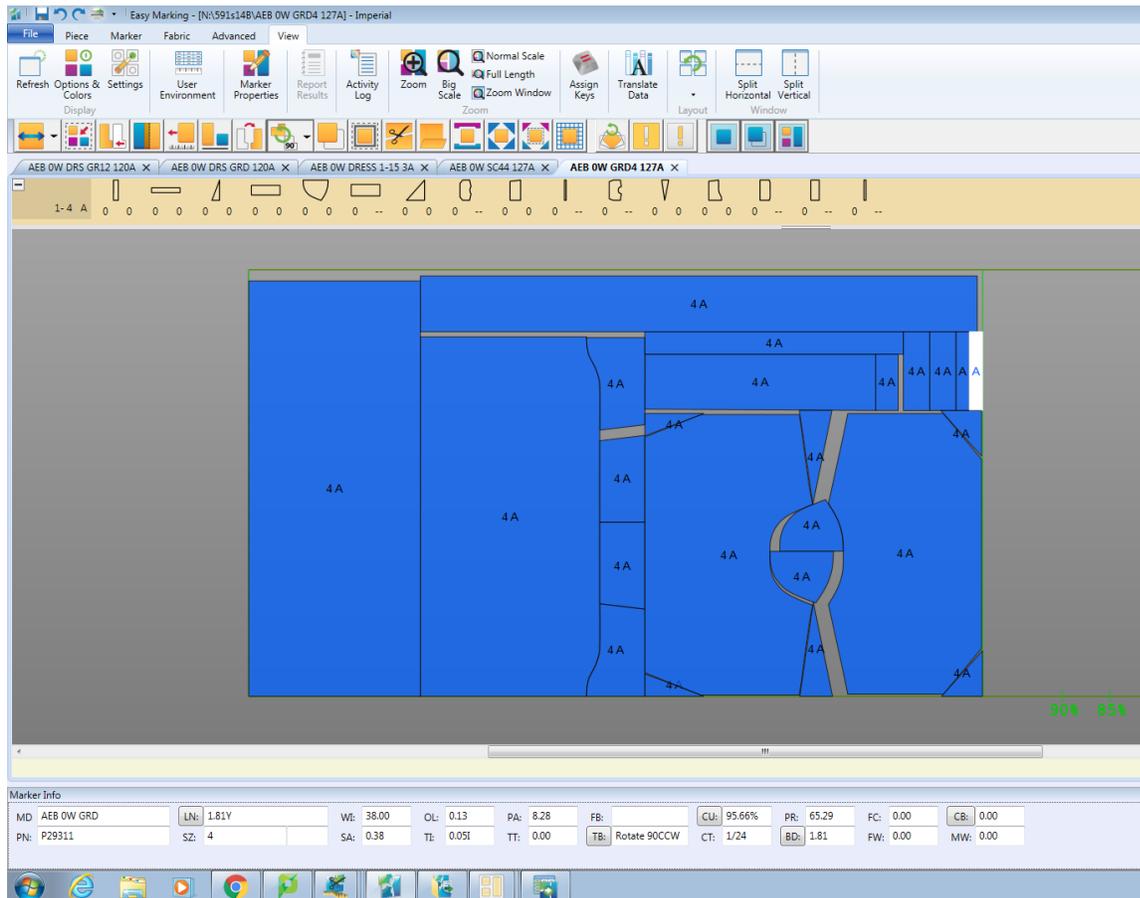


Figure 13 Marker for garment 2, conventional grading size 4. The white pattern piece is due to Gerber not allowing the piece to be de-selected at the end of the marker making process and does not indicate anything about that particular piece.

The marker for garment 3 was created in two different widths for measurement purposes because the size 12 graded pattern pieces were wider than 38” and would not fit on the 38” wide marker. The first attempt at the marker for garment three was 38” wide and used 68.3% of the fabric in the marker, however not all of the pattern pieces were placed in the marker due to insufficient fabric width (see **Figure 14**).

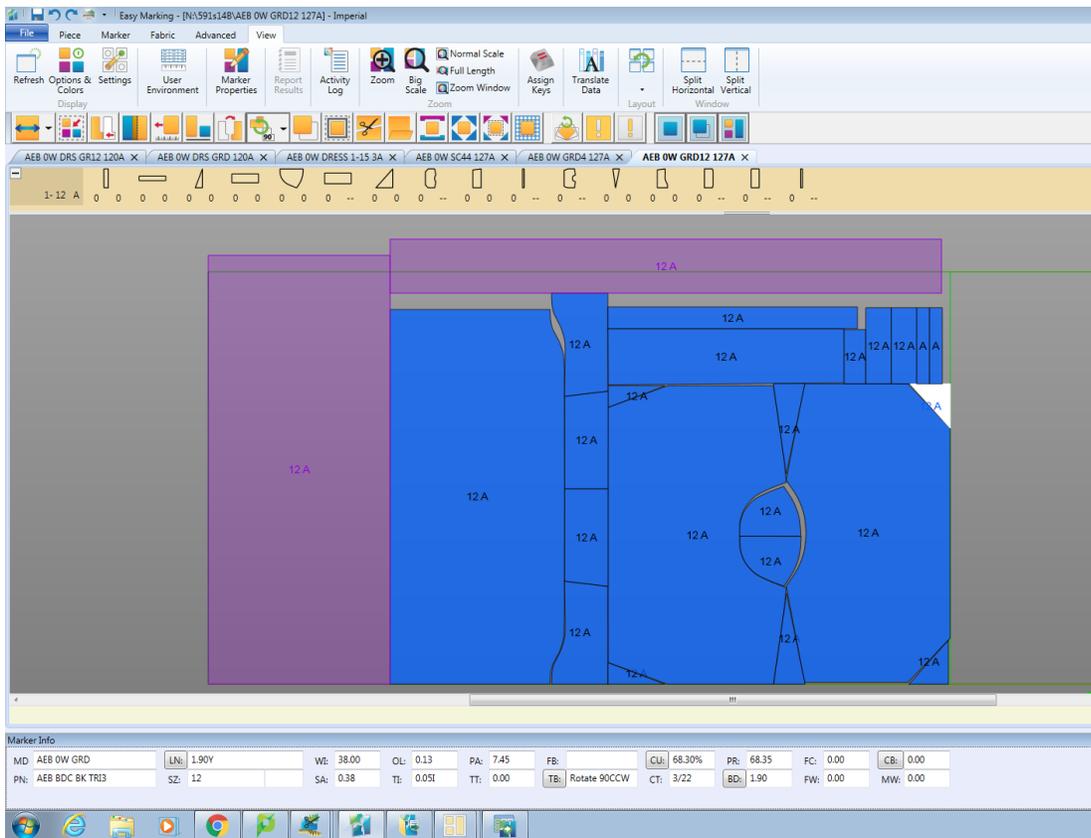


Figure 14 Marker for garment 3, conventional grading size 12, 38" wide. The white pattern piece is due to Gerber not allowing the piece to be de-selected at the end of the marker making process and does not indicate anything about that particular piece.

The second attempt involved increasing the marker width to 41.1". The adjusted marker for garment 4 was 41.1" wide and used 95.71% of the fabric in the marker (see **Figure 15**), however the muslin fabric is not available in this width at retail.

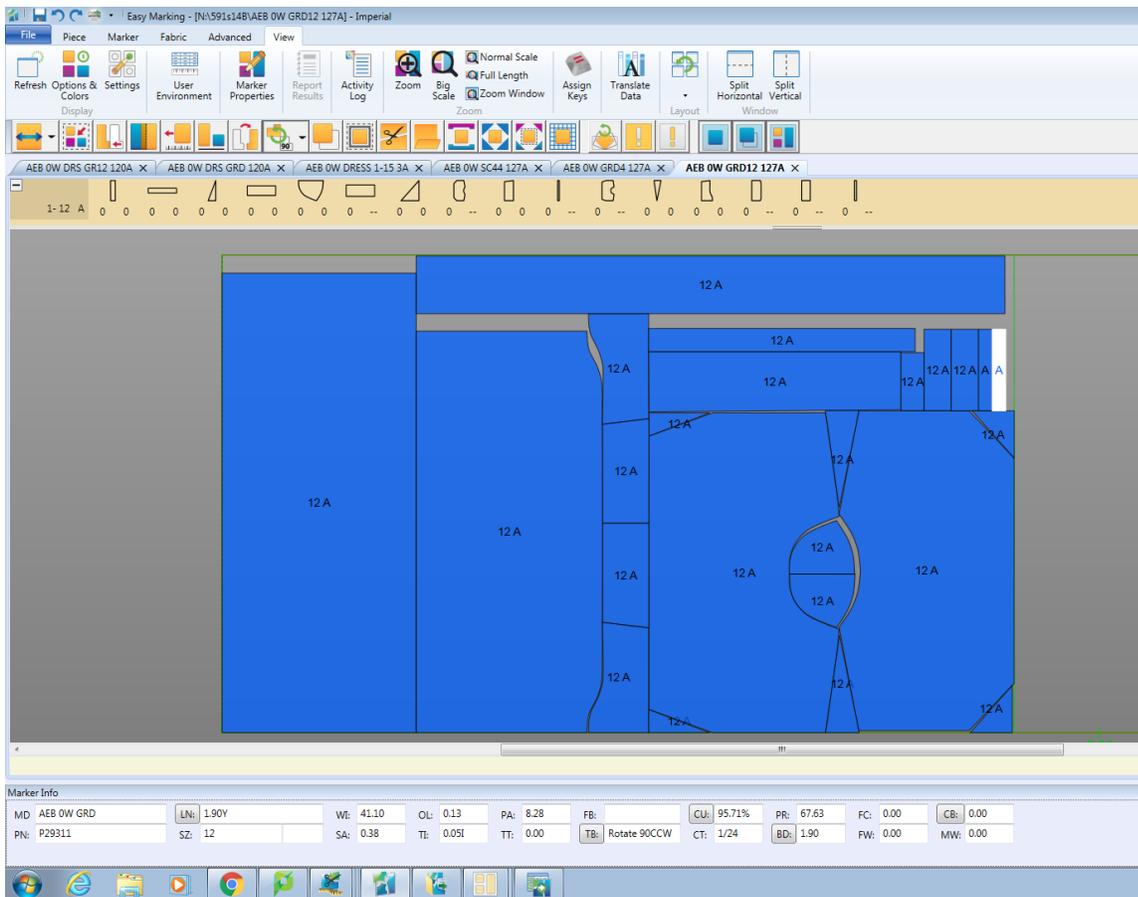


Figure 15 Marker for garment 3, conventional grading size 12, 41.1" wide. The white pattern piece is due to Gerber not allowing the piece to be de-selected at the end of the marker making process and does not indicate anything about that particular piece.

Varying Widths of Fabric Grading Method (Garments 4 and 5)

The three fabric widths used in this study were 36" (size 4), 38" (size 8), 44" (size 12). The fabric widths were chosen based on commercially-available widths that were available for muslin. The marker for garment 4 were created by scaling the pattern pieces of the size 8 zero-waste base garment (garment 1), using Accumark PDS scale tool down by 5.26%, which equals the percent difference between the 38" fabric width and the 36" fabric width. The marker for garment 5 was created in the same way; however, it was scaled up from the size 8 zero-waste

base garment (garment two) by 15.78% to reflect the percent difference between the 38” fabric width and the 44” garment width.

The marker for garment 4 was 36” wide and used 99.6% of the fabric in the marker (see **Figure 16**).

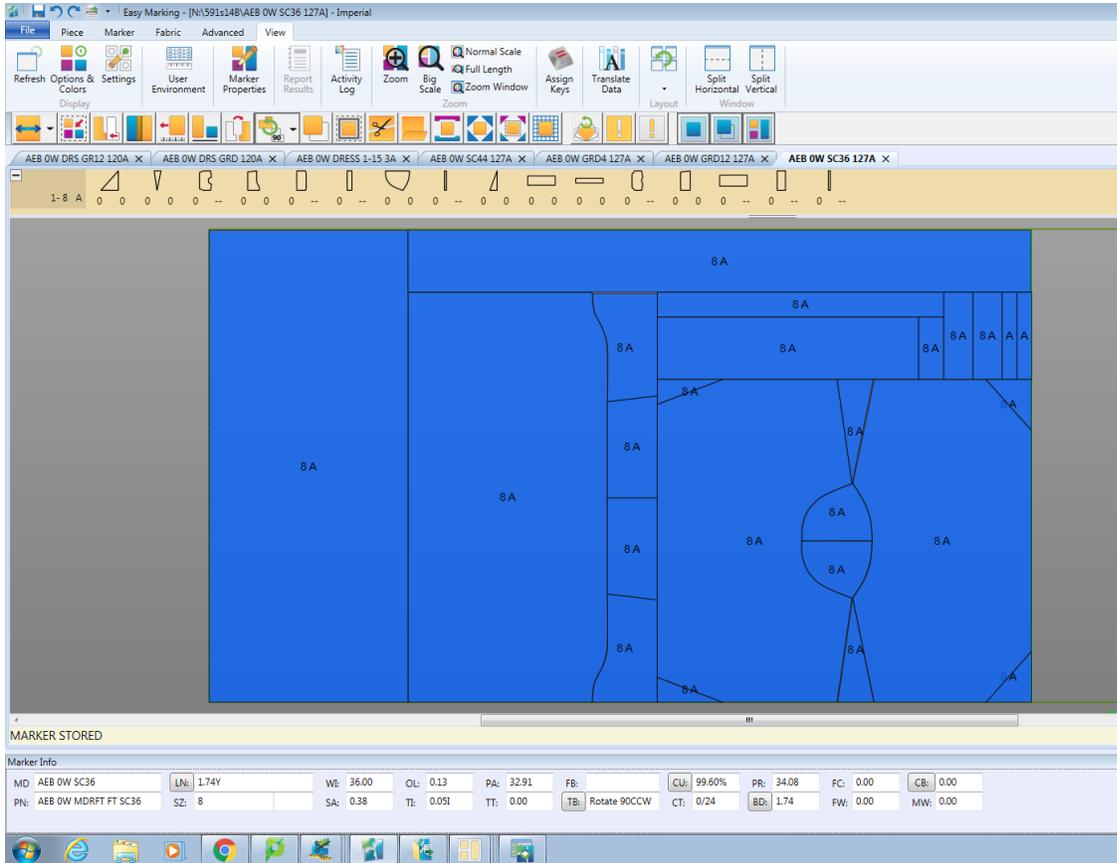


Figure 16 Marker for garment 4, 36" wide, size 4

The marker for garment five was 44” wide and used 99.93% of the fabric in the marker (see **Figure 17**).

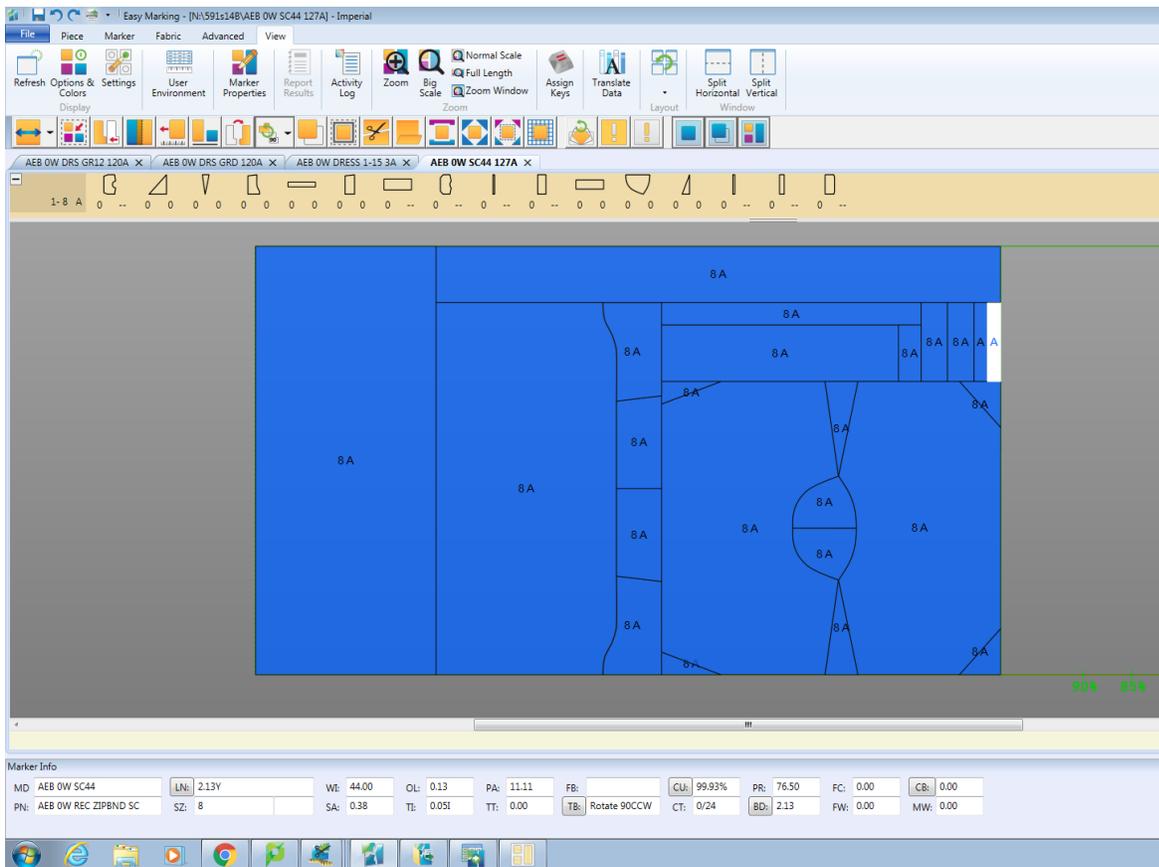


Figure 17 Marker for garment 5, 44" wide, size 12

4.1.2 Summary

Garment 1 and garment 5 had the highest fabric utilization percentage with 99.93%. Garment 4 had 99.6% fabric utilization. Garment 2 had 95.6% fabric utilization and the control garment had 62.28% fabric utilization. An accurate fabric utilization was not measured for garment 3 because the marker was wider than the 38" width of fabric could accommodate and the pieces could not be placed. Changing the marker to a wider width would have meant increasing the width of the fabric (see **Table 2**).

Table 2 *Amount of Fabric Waste for Each Marker*

	Grading Method	Size	Fabric Utilization %
Garment 1	Redesigned	8	99.93
Garment 5	Varying widths of fabric	12	99.93
Garment 4	Varying widths of fabric	4	99.6
Garment 2	Conventional grading	4	95.6
Garment 3	Conventional grading	12	N/A
Control	Non-zero waste garment	8	62.28

4.2 Objective 2: Fit and Design Integrity

The second objective of the pilot study was to analyze the fit and design integrity of the garments constructed from each grading method. Six garments (see **Figure 18** through **Figure 23**) were constructed from the markers created in objective one. Three expert evaluators scored design and fit of each of the six garments using specific criteria on a Likert-type scale on an adapted survey (Outling & Istook, 2007) instrument (see Appendix C). The raw scores were converted to percentages and compared to determine the highest scoring garment for both fit and design. Evaluator A took 75 minutes to complete the evaluation. Evaluator B took 118 minutes to complete the evaluation. Evaluator C took 43 minutes to complete the evaluation. The evaluation took place at the College of Textiles on the same day in the same room. A size 4 Alvanon dress form was used to evaluate the size 4 garments, a size 8 Alvanon dress form was used to evaluate the size 8 garments, and a size 12 PGM dress form was used to evaluate the size 12 garments. The missy size specifications are based on Alvanon dress forms, which use ASTM measurement standards (see Table 3 **Error! Reference source not found.**).

Table 3 Dress Form Measurements

	Missy 4 (inches) Alvanon	ASTM Size 4 Standard	Missy 8 (inches) Alvanon	ASTM Size 8 Standard	Missy 12 (inches) PGM	ASTM Standard
Across shoulder back	15 1/8	15 1/8	15 1/2	15 1/2	15 1/2	15 3/4
Bust	34 1/8	34 1/8	36 1/4	36 1/4	38	38 3/4
HPS to apex	10 1/8	N/A	10 3/8	N/A	10 1/4	N/A
Waist	27 5/8	27 5/8	29 1/2	29 1/2	29	32 1/4
CF neck to waist	14 1/4	14 1/4	14 1/2	14 1/2	15	14 5/8
CB neck to waist	16 1/8	16 1/8	16 1/8	16 1/8	17 1/4	16 1/4
Low hip	36 5/8	36 3/8	38 1/2	38 1/2	39	41

Alvanon dress form missy straight measurements, gathered from www.Alvanon.com and measured from PGM size 12 dress form. From. "Standard Tables of Body Measurements for Adult Female Misses Figure Type, Size Range 00-20." ASTM, 2011, www.astm.org/Standards/D5585.htm

4.2.1. Evaluators

The following profiles describe the expert evaluators in the study:

Evaluator A

Evaluator A is a PhD candidate at North Carolina State University studying textile technology management focusing on knitwear product development. She is a teaching assistant and lecturer for draping and fashion studio classes. Evaluator A graduated from North Carolina State University College of Textiles with a Bachelor's degree in Fashion Development and Product Management and a Master's degree in Textile Technology Management.

Evaluator B

Evaluator two has taught and worked in fashion and textiles, for thirteen years and has taught design, technical design, design construction, design innovation, social and economic trend forecasting, textiles, and CAD. Evaluator two has industry experience in manufacturing and product innovation for a range of industries and is a current PhD candidate at North Carolina State University College of Textiles.

Evaluator C

Evaluator C is a North Carolina State University College of Textiles graduate with a concentration in Fashion Development and Product Management and has over five years of retail buying experience. Evaluator C is a current Master of Science student at the North Carolina State University College of Textiles concentrating on branding and retail.

4.2.2 Sample

The following garments were constructed in muslin fabric and are shown in **Figure 18** through **Figure 23**:

Control - Size 8 non-zero-waste garment

Garment one – redesigned base size 8 zero-waste garment

Garment two - size 4 garment, conventional grading

Garment three - size 12 garment, conventional grading method

Garment 4- size 4 garment, varying widths of fabric method

Garment five - size 12 garment, varying widths of fabric method

Control Garment

Evaluator A gave the control garment (see **Figure 18**) a score of 88.39% for fit and 75% for design. Evaluator B gave a score of 65.81% for fit and 40% for design. Evaluator C gave a score of 89.03% for fit and 100% for design (see **Table 4**).



Figure 18 Control garment, size 8 non-zero waste

Evaluator A gave garment 1 (see **Figure 19**) a score of 56.13% for fit and 55% for design. Evaluator B gave garment 1 a score of 36.45% for fit and 20% for design. Evaluator C gave garment 1 a score of 82.58% for fit and 80% for design (see **Table 4**).



Figure 19 Garment one, size 8 jigsaw zero-waste garment

Conventional Grading Method

Evaluator A gave garment 2 (see **Figure 20**) a score of 55.48% for fit and 55% for design. Evaluator B gave garment 2 a score of 39.35% for fit and 20% for design. Evaluator C gave garment 2 a score of 89.68% for fit and 70% for design (see **Table 4**).



Figure 20 Garment two, size 4 conventional grading method

Evaluator A gave garment 3 (see **Figure 21**) a score of 47.1% for fit and 40% for design. Evaluator B gave garment 3 a score of 28.39% for fit and 20% for design. Evaluator C gave garment 3 a score of 82.58% for fit and 80% for design (see **Table 4**).



Figure 21 Garment three, size 12 conventional grading method

Varying Widths of Fabric Grading Method

Evaluator A gave garment 4 (see **Figure 22**) a score of 56.77% for fit and 70% for design. Evaluator B gave garment 4 a score of 51.94% for fit and 5% for design. Evaluator C gave garment 4 a score of 88.39% for fit and 100% for design (see **Table 4**).



Figure 22 Garment 4, size 4 36" width fabric

Evaluator A gave garment 5 (see **Figure 23**) a score of 34.84% for fit and 30% for design. Evaluator B gave garment 5 a score of 18.06% for fit and 5% for design. Evaluator C gave garment 5 a score of 82.58% for fit and 70% for design (see **Table 4**).



Figure 23 Garment five, size 12 44" width fabric

4.2.3. Summary

The control garment was evaluated as the best fit and best design, which validated the researcher’s assumptions that the non-zero-waste size 8 garment (the control garment) would have the best fit and design. If the control garment is removed from the sample, then garment two had the highest score for fit from one evaluator and garment 4 received the highest score for fit from two evaluators. Excluding the control garment, garment 4 had the highest score for design from two of the three evaluators (see **Table 4**).

Table 4 *Fit and Design Integrity Evaluation Scores for Each Garment*

Garment #	Evaluator A		Evaluator B		Evaluator C		Fit Avg%	Design Avg%
	Fit	Design	Fit	Design	Fit	Design		
Control	88.39%	75.00%	65.81%	40.00%	89.03%	100.00%	81.08	71.67
1	56.13%	55.00%	36.45%	20.00%	82.58%	80.00%	58.39	61.67
2	55.48%	55.00%	39.35%	20.00%	89.68%	70.00%	61.50	48.33
3	47.10%	40.00%	28.39%	20.00%	85.81%	95.00%	63.77	51.67
4	56.77%	70.00%	51.94%	5.00%	88.39%	100.00%	65.7	58.33
5	34.84%	30.00%	18.06%	5.00%	82.58%	70.00%	45.16	35.00

Chapter 5: Discussion, Conclusions and Recommendations

This pilot study was designed to test the fabric utilization of two methods of pattern grading for a zero-waste garment by comparing the amount of fabric used in the marker for six graded garments. The fit and design integrity of each of the garments was scored and ranked in order to determine the success of the grading methods. The study also shows that grading a jigsaw-type zero-waste garment by varying the widths of fabric does maintain zero-waste criteria of the base jigsaw garment; however, the fabric waste created by conventional grading is a small percentage compared to industry norms. The results of the study show that the control garment; the size 8 re-designed zero-waste garment (garment 1), and the size 4 narrow fabric grading method (garment 4) scored the highest of the garments evaluated, but the size 12 wider fabric grading method (garment 5) scored the lowest. This chapter will discuss the results of each grading method and the fit and design evaluations.

5.2 Grading the Redesigned Garment by Conventional Method

The pattern pieces for garment 2 and 3 were created by grading the jigsaw pattern pieces created from garment one using Gerber Accumark® software. Grade rules that correspond to a missy grade rule (see Appendix B) were assigned to cardinal points on each piece. The software system constrained how the grading was performed. The grade function in the software created a zero to twelve size range for the garment. Two sizes were selected from the size range in order to manage the scope of the study. Size 4 (garment 2) and size 12 (garment 3) were selected because they were both two size steps away from the base size 8 garment; which allowed a

consistent range of fit between sizes as well as enough movement away from the base size 8 to show a meaningful difference in fit.

The markers for the size 4 and size 12 garments were both made for 38” width fabric in order to keep the fabric widths between the control garment, garment 1, garment 2, and garment 3 consistent.

The size 4 conventionally graded pattern pieces (garment 2) fit into the 38” width fabric and wasted 4.34% of the fabric in the marker. While this garment no longer qualifies as a zero-waste garment because of the small percentage of fabric waste, it still has a much higher fabric utilization than the industry norm, which is roughly 80% (Cooklin, 1997).

The size 12 conventionally graded pattern pieces for garment three did not fit into the 38” fabric marker. The base size 8 garment already used the full width of the 38” fabric, so when the widths of the pieces were increased for the size 12 grade they became wider than 38”. Gerber Accumark does not allow pieces that do not fit into the marker to be placed, which meant that the pieces that were too wide could not be included in the 38” marker, making the fabric utilization measure inaccurate. The pieces that Gerber Accumark would not allow to be placed in the marker were the skirt back, which started out as the full width of the marker, and the skirt extension, which was created from the negative space of the control garment. The researcher chose to increase the width of the marker to 41.1” in order to accommodate these two pieces in the narrowest possible width in order to measure the fabric utilization. Neither fabric utilization measurement for garment three was accurate because either all the pieces could not be placed or the desired marker width is not an available width of fabric. Another option to make the size 12 graded pattern pieces fit into the 38” fabric marker would have been to change the dimensions of

the two pattern pieces after they had been graded so that they would fit, which the researcher chose not to do because the resulting marker would have been created using more than one method of grading (conventional grading and redesigning the garment).

The results of the first objective for conventional grading show that conventional grading is not successful for grading up from a base zero-waste garment that is in the middle of the size range but it is possible when grading down from the base size. A recommendation for this problem might be to make the largest size in the size range the base size zero-waste garment so that all of the garments in the size range are graded down from the base size. However, based on the decrease in fabric utilization from the base size 8 garment to the size 4 garment, the fabric utilization will most likely decrease from size to size as the sizes grade down, thus decreasing efficiency and increasing waste.

5.3 Grading by Varying the Widths of Cutable Fabric

The pattern pieces for garments 4 and five were created by scaling the size 8 redesigned zero-waste garment (garment one) pattern pieces using Gerber PDS scaling tool to varying widths of fabric.

The sizes of the garments were limited by commercially available muslin widths and the widths of fabric used were not consistent between size ranges. Since 38” muslin was used for the size 8 base zero-waste garment, the next width down of available muslin was chosen for the size 4 garment (garment 4), which was 36” wide; and the next available width up was chosen for the size 12 garment (garment 5), which was 44” wide.

The size 4 marker was created by scaling the pattern pieces for garment 1 down by 5.26% in order to fit the 36” wide fabric and the size 12 marker was created by scaling the pattern

pieces for garment 1 up by 15.78% in order to fit the 44” wide fabric. There was a about a 20% difference in amount of growth between the two sizes, which means that the size that was graded up was actually closer to a size 18 than to a size 12. Ideally garment 4 and garment 5 would have been scaled the same amount to maintain consistent growth in the size range, but this was not possible due to the limitation of the fabric widths at retail.

Because the markers for both garment 4 and garment 5 were scaled proportionally, the pattern pieces were still able to interlock into the same jigsaw pattern as the marker for garment 1. The markers for both garment 4 and garment 5 maintained the 99.9% fabric utilization of garment 1 (see **Figure 16** and **Figure 17**).

Of the four graded garments, garment 4 (size 4, 36” width fabric) received the highest scores for fit and design and garment 5 (size 12, 44” width fabric) received the lowest scores for fit and design, making it difficult to form concrete conclusions about the success of the varying widths of fabric grading method as a whole; however, it does suggest that the success of this method is dependent on the width of the fabric available and the percent growth in the scaling of the pattern pieces. The low score of garment 5 could be attributed to scaling the pattern up too much proportionally due to fabric that is commercially available.

Scaling the pattern pieces by a percentage means that the overall shape of the piece is changed proportionally, rather than only changing specific dimensions of the piece as one would in conventional grading. For example, in conventional grading if the waist measurement of a bodice increases by one inch then the length of the piece from the high-point-shoulder (HPS) to the waist may only increase by one-quarter inch because separate growth amounts are assigned

to each measurement. However, if the same piece is scaled so that the waist measurements increases by one inch then the length from the HPS to the waist will also increase by one inch.

Though there are many studies that have shown that conventional grading methods do not accurately resemble the way the body actually increases or decreases in size, it is still widely accepted that different growth amounts for different points of measure are needed for a good fit. It is therefore a surprising result that the garment scaled to the narrowest width of fabric (garment 4) had the highest score for fit and for design. It would have been more expected to see garments 2 and 3 score higher than garment 4 because conventional grading was expected to maintain the design and fit of the base garment at the expense of creating fabric waste. The success of garment 4 compared to garments 2 and 3 suggest that a zero-waste pattern may be able to be graded into different sizes while maintaining acceptable fit and design integrity without creating fabric waste.

Varying fabric widths could be a useful grading tool for zero-waste garments, but would require being able to control the fabric widths for each size in order to control the size range. The size range between garment 1 and garment 4 is two sizes and difference in fabric width between the two garments is 2", so if the fit of garment 4 and garment 8 are considered acceptable then it may be worthwhile to test whether 1" increments in varying fabric width between sizes in a full size range would be acceptable. Of course fabric is rarely sold in 1" width increments, so such a study or practice would require that the researcher or designer have access to custom fabric widths. Such a study would also be dependent on the type of garment being graded. A garment of a difference style would likely have different grading and fit requirements.

Likely the most realistic way of using the varying widths of fabric grading method for zero-waste garments is to let the width of the fabric determine the size of the garment. So rather than determining the size of the garment and then finding or producing the correct width of fabric for that size, the available fabric width would be determined and then the size or size range would be dependent on the available fabric widths. A precedent for this can be found in the manufacturing of tubular knit t-shirts. The t-shirts are knit on circular knitting machines that have varying diameters, which produce different diameters of tubes of fabric. The size of the t-shirt is determined by the diameter of the machine on which the tubular fabric is knit. Rather than constructing a machine that is the diameter of a predetermined size, the full size range is determined by the diameters of the machines available.

5.4 Limitations of the Study

Only three expert evaluators were invited to evaluate the garments, therefore broad conclusions cannot be drawn about the success of each grading method regarding fit and design integrity for this study. There were wide discrepancies between the scores of each evaluator; evaluator B scored all of the garments very low and evaluator C scored all of the garments very high. Though the actual scores from each evaluator were so varied, as a whole the top and bottom scoring garments were consistent between all three evaluators. Future studies could include a larger sample size of participants in order to get a more clear view of the success or failure of each garment and of the grading methods as a whole.

The two dress forms used in the study were from two different brands: Alvanon and PGM. The size 4 and both size 8 forms were Alvanon dress forms and the size 12 form was

PGM. Ideally the size 12 form would have also been an Alvanon form, however a size 12 Alvanon dress form was not available to the researcher. The two different brands use different measurements for their base sizes and different growth increments between sizes. In addition, the overall shape of the Alvanon dress forms are more curvy than the PGM dress forms, meaning the Alvanon dress forms have larger bust and hip measurements across the size range than the PGM forms. Additionally, it would have been ideal for the dress forms to match the standard from which the grade rules were defined. The age of the dress forms also impact how the measurements of the forms conform to the ASTM standards. Since the ASTM standards are updated, older dress forms may no longer be to ASTM standard. The use of a different brand of dress form for the size 12 garments could attribute to the low fit and design scores of garments 3 and 5. Studies in the future are recommended to use one brand of dress form for the entire size range (see Table 3), as well as match the standard for the grade rule.

5.5 Conclusion

The first objective of this study succeeded in measuring the amount of fabric waste created by grading a zero-waste garment using two different grading methods. The second objective of the study did not achieve usable conclusions, but it did suggest that grading by varying widths of fabric could be preferable to conventional grading from a fit and design perspective. The results of the study show that scaling the pattern pieces of a jigsaw zero-waste garment proportionally to fit varying widths of fabric does not create fabric waste, but it would require control the fabric widths for each size down to the closest inch in order to maintain acceptable fit. Fabric is rarely sold in one-inch width increments, so customization would be necessary. The results also show that grading a zero-waste garment conventionally does create

fabric waste; however, the amount of fabric waste created is still less than industry norms. It would be possible to use conventional grading on a zero-waste garment if the base size is the largest size in the size range. By examining the results from the first and second objective together, we are able to predict that it may be possible to grade a zero-waste garment by varying the width of the fabric for each size without sacrificing the fit or design of the garment.

5.6 Recommendations

Further study is required to determine if either of these zero-waste grading methods is valid for industry use. Future research could compare the feasibility of the conventional grading method and the varying widths of fabric method with different types of zero-waste garments. Though the methods tested worked for the control garment tested in this study, the results may be very different for a different garment silhouette or a garment designed using a different zero-waste design method.

The validity of future studies could be improved by using a larger sample size of evaluators with varying levels of expertise and experience. Also, using one dress form brand across the entire size range would be beneficial so that growth increments are consistent and fit and design integrity can be more accurately evaluated. Additionally, evaluating the fit and design integrity on live fit models could provide valuable feedback from the consumer perspective.

It would be interesting to examine how different grading methods can be used in tandem in order to meet the needs of different zero-waste garment designs. The nature of zero-waste design allows for an enormous amount of variation in garment outcomes, so likelihood of a one-method-fits-all approach is slim. It is more likely that a grading method would need to be

adapted to the design of the specific garment. For example, perhaps a garment is graded by using conventional grading as a starting point to ensure that fit across the size range remains consistent, and then the extra negative space in the marker created by grading down is re-designed back into the garment for each size.

In order to determine if these grading methods are logistically possible for industry to use, there needs to be more experimentation with grading zero-waste garments.

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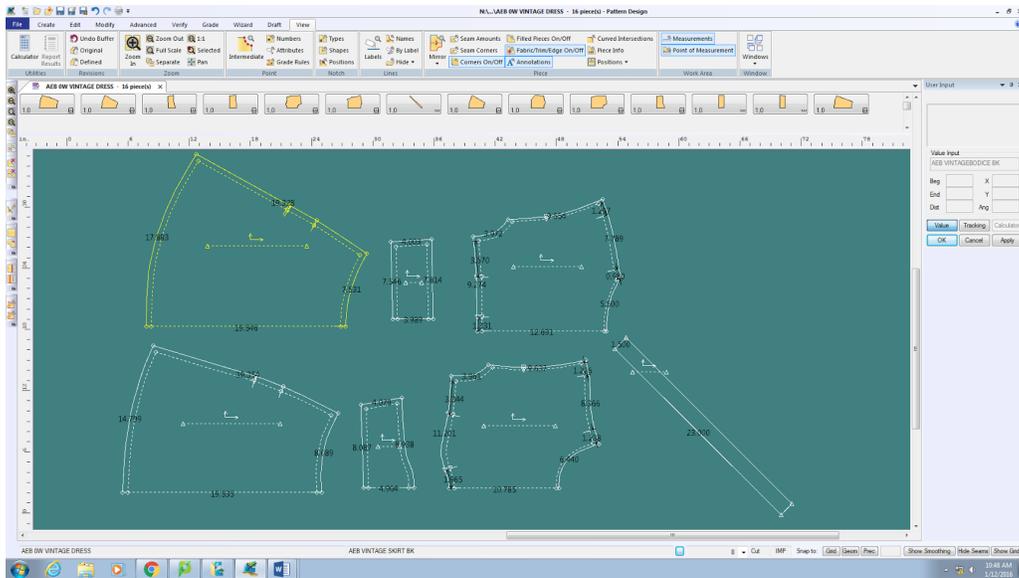
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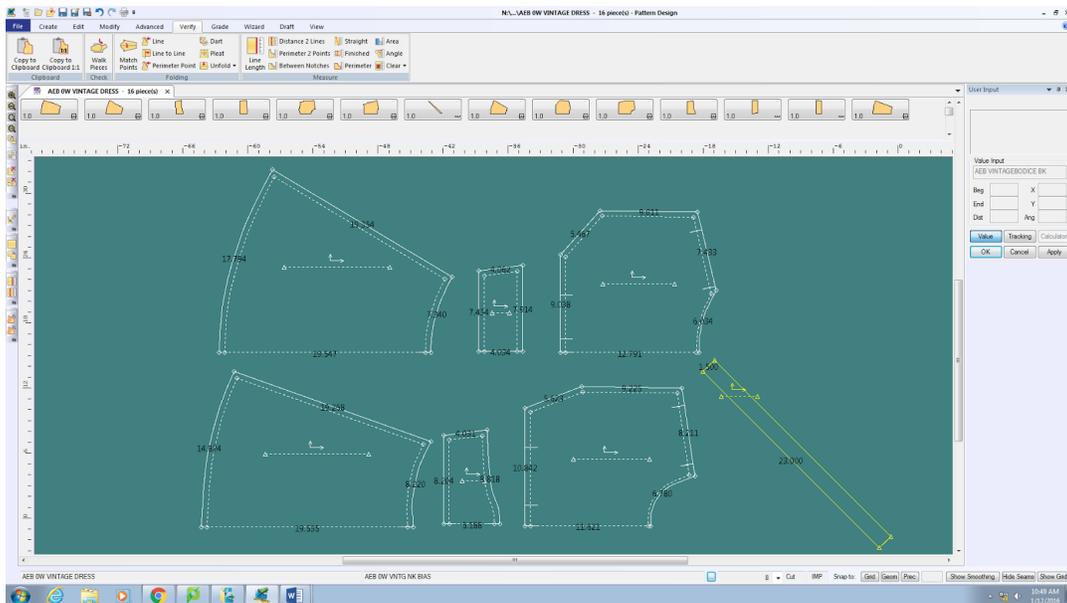
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Appendices

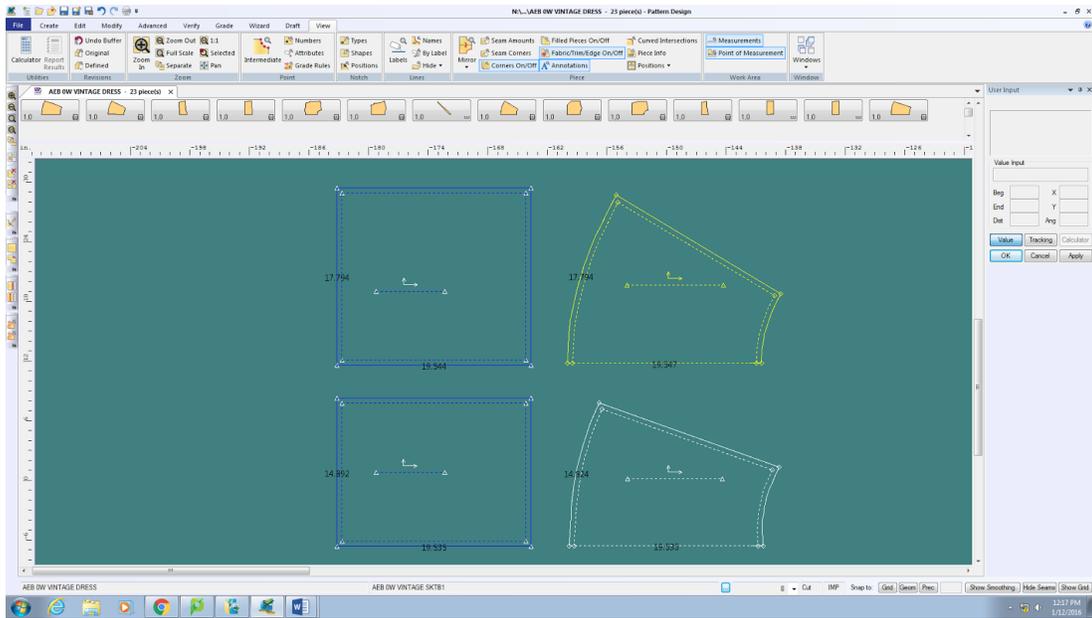
Appendix A: Re-designed Jigsaw Zero Waste Garment



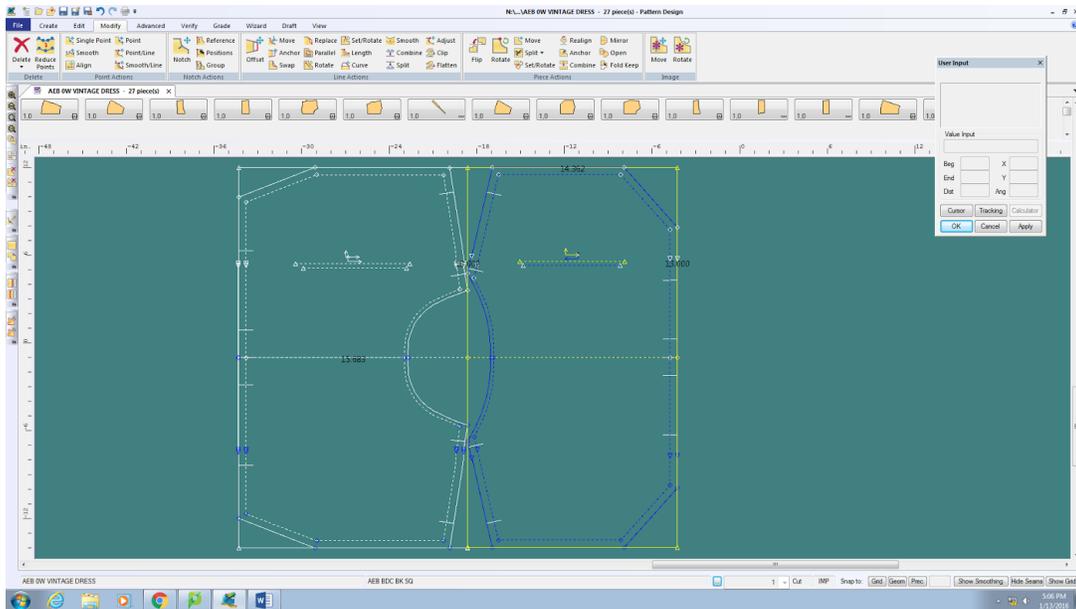
A. 1 The re-design began with a size 8 non-zero waste garment that was designed by the researcher



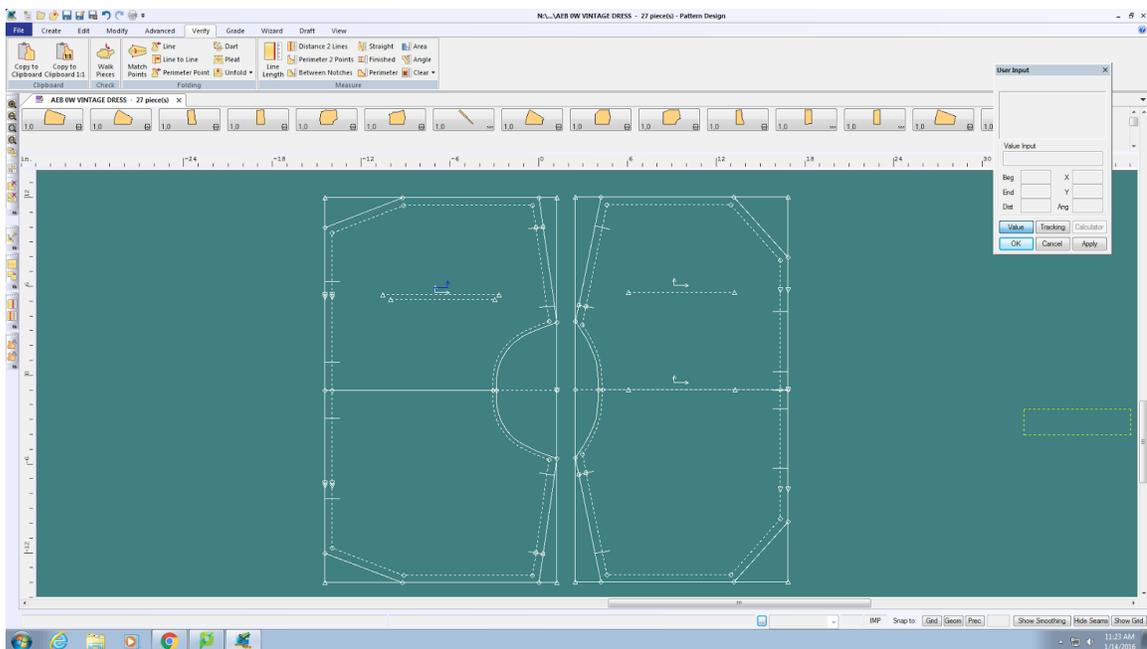
A. 2 First, curves were removed from the pattern pieces. Curves at the neckline, waistband, and skirt were left in the pattern pieces in order to preserve some of the shaping of the garment



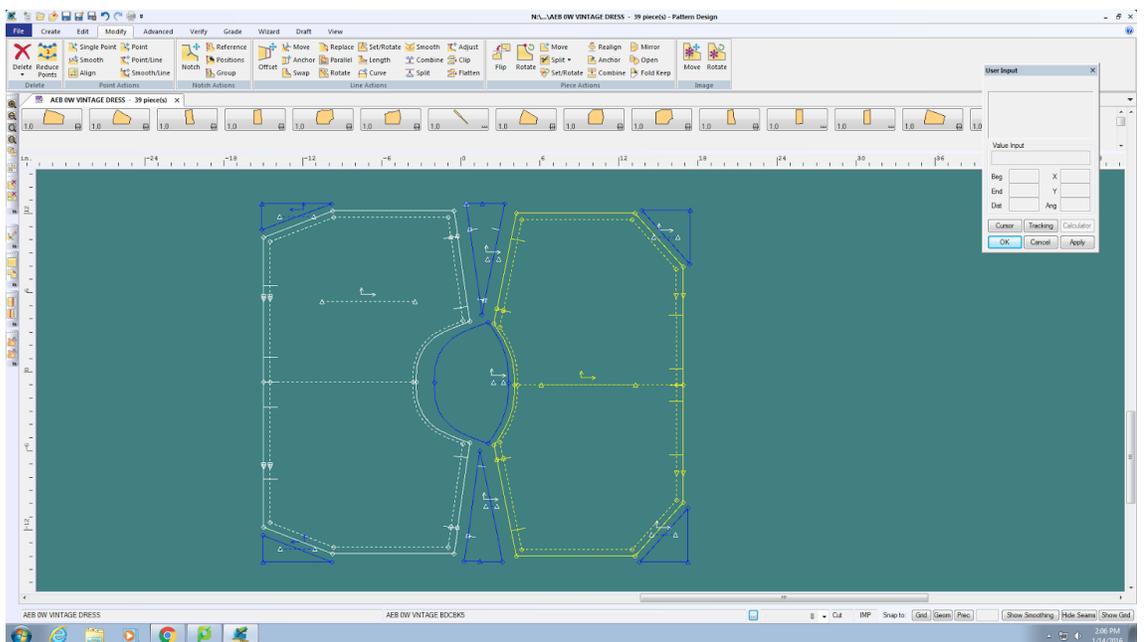
A. 3 Rectangles were drafted using the skirt length and hem sweep measurements, taking into account using the full width of the muslin fabric.



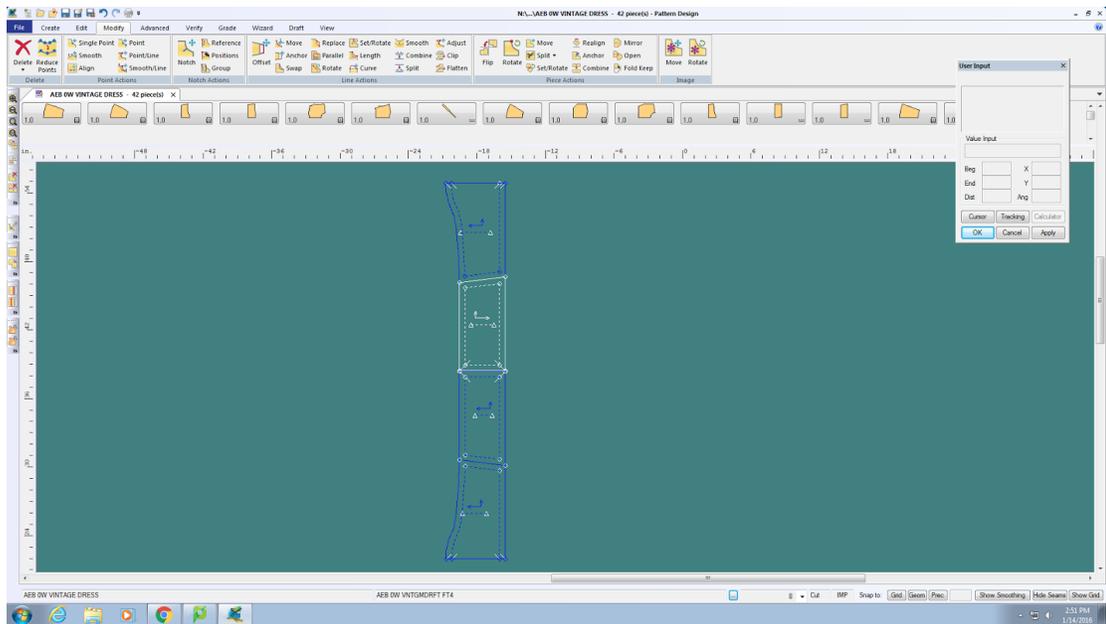
A. 4 Next, the bodice front and bodice back were unfolded and the bodice back was flipped so that the front and back necklines face each other. Rectangles were drawn around both pieces in order to extract the negative space around the pieces. The HPS points were adjusted so that they touch.



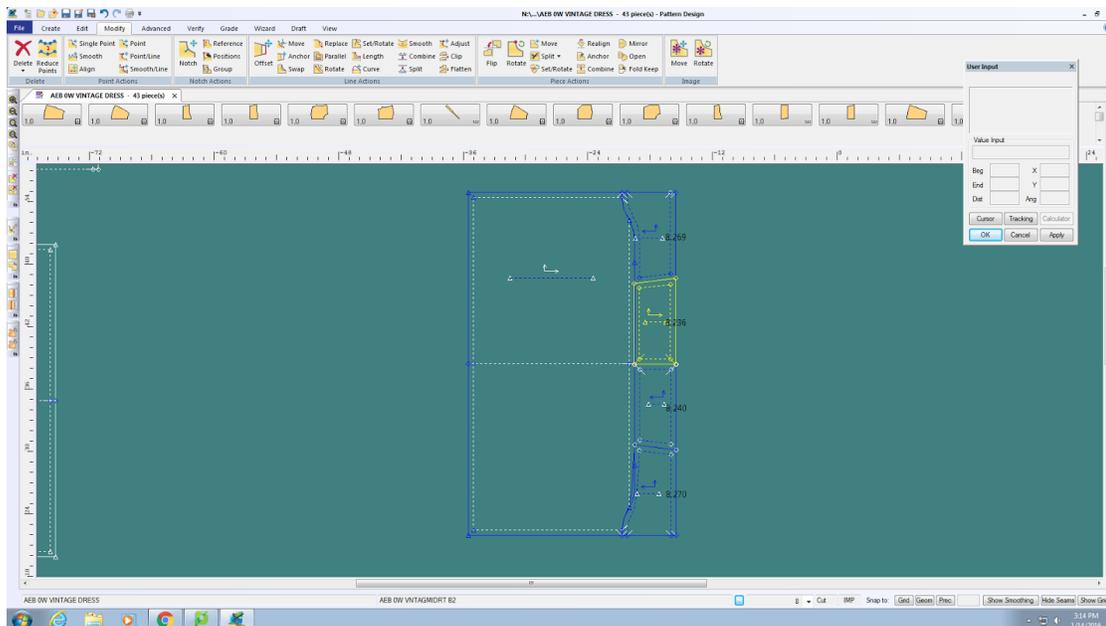
A. 5 Then, the negative space around the bodice front and bodice back pattern pieces were extracted so that six triangles and one curved neck hole piece were created. These pieces became zipper facing, zipper binding, pocket facing, and pocket bags.



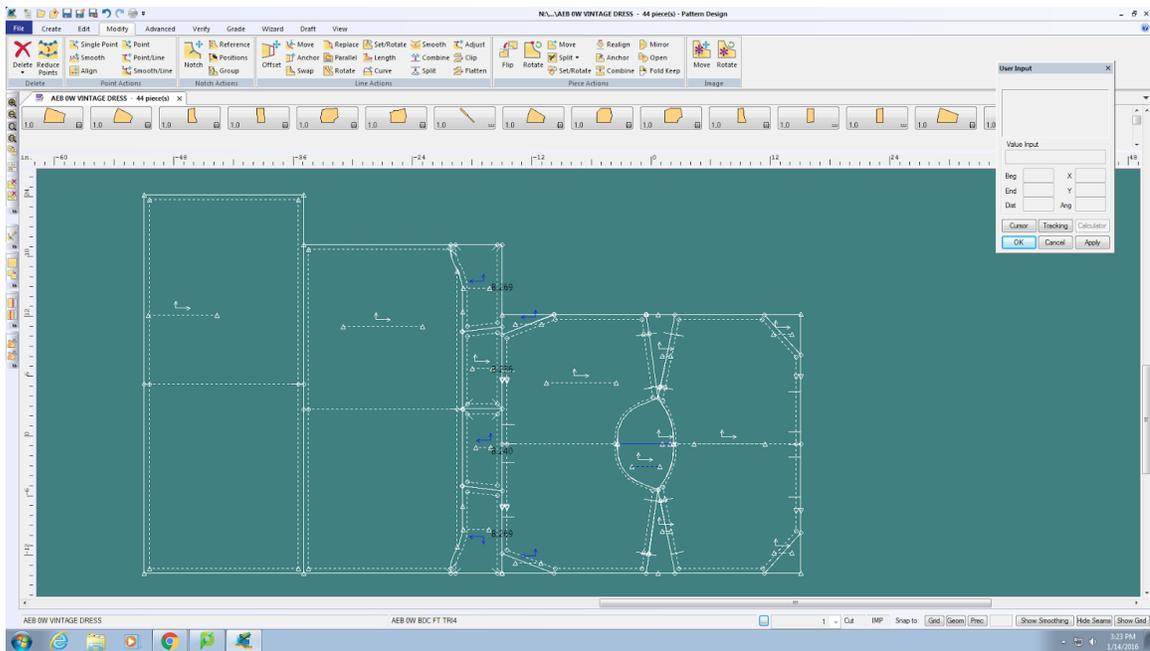
A. 6 Extracted pieces from bodice negative space



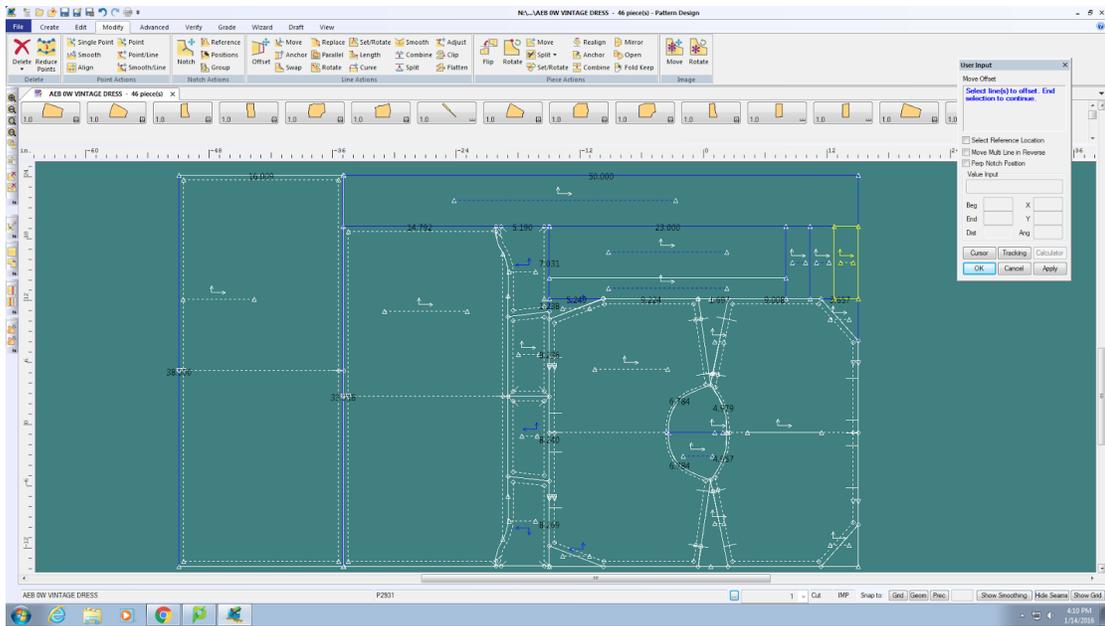
A. 7 Next, the waistband pieces were split at center front and center back. The front waistband pieces were flipped vertically and horizontally so that the side seams of the front and back waistband pieces line up to somewhat create a rectangle. The angle of the side seams were adjusted to close any gaps between the pieces.



A. 8 The waistband pieces were lined up with the skirt front piece so that the center front of the skirt lined up with the center back of the waistband and the curve at the center front of the waist band overlapped with the side waist corners of the skirt. The overlapped area of the skirt was trimmed away to create the pocket area.



A. 9 All of the rectangular groups of pattern pieces were stacked together so that there was no space between the pieces. The remaining negative space was divided up into rectangles to be used for neck binding, zipper binding, pocket pieces, and a band at the hem of skirt.



A. 10 The resulting re-designed pieces interlock together, creating a jigsaw zero-waste marker

Appendix B: Missy Grade Rules

Grade Method: Small-Large Incremental
 Grade Rules in Library: 70
 Total Size Breaks: 6

Comments: MISSY

Size Names: Numeric
 Base Size: 8
 Size Step: 2
 Smallest Size: 0

Next Size Breaks: 2
 4
 6
 8
 10
 12

Number:	1		100		101	
Comment:			NO RULE		CF NECK PT	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	0.25	0.12	0.00	0.00	0.12	0.00
2 -4	0.25	0.12	0.00	0.00	0.12	0.00
4 -6	0.25	0.12	0.00	0.00	0.12	0.00
6 -8	0.25	0.12	0.00	0.00	0.12	0.00
8 -10	0.24	0.25	0.00	0.00	0.12	0.00
10 -12	0.24	0.25	0.00	0.00	0.12	0.00
Number:	102		103		104	
Comment:	SH NECK PT		SH PT		ARMHOLE NOTCH	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	0.25	0.06	0.25	0.25	0.00	0.12
2 -4	0.25	0.06	0.25	0.25	0.00	0.12
4 -6	0.25	0.06	0.25	0.25	0.00	0.12
6 -8	0.25	0.06	0.25	0.25	0.00	0.12
8 -10	0.25	0.12	0.25	0.38	0.00	0.25
10 -12	0.25	0.12	0.25	0.38	0.00	0.25
Number:	105		106		107	
Comment:	ARMHOLE SS PT		SS WAIST PT		WAISTL DART	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	0.00	0.25	-0.12	0.25	-0.12	0.12
2 -4	0.00	0.25	-0.12	0.25	-0.12	0.12
4 -6	0.00	0.25	-0.12	0.25	-0.12	0.12
6 -8	0.00	0.25	-0.12	0.25	-0.12	0.12
8 -10	0.00	0.38	-0.12	0.38	-0.12	0.12
10 -12	0.00	0.38	-0.12	0.38	-0.12	0.12
Number:	108		111		112	
Comment:	CF WAIST PT		CB NECK PT		AYS SH NECK PT	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	-0.12	0.00	0.19	0.00	0.25	-0.06
2 -4	-0.12	0.00	0.19	0.00	0.25	-0.06
4 -6	-0.12	0.00	0.19	0.00	0.25	-0.06

Number:	108		111		112	
Comment:	CF WAIST PT		CB NECK PT		AYS SH NECK PT	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
6 -8	-0.12	0.00	0.19	0.00	0.25	-0.06
8 -10	-0.12	0.00	0.19	0.00	0.25	-0.12
10 -12	-0.12	0.00	0.19	0.00	0.25	-0.12
Number:	113		114		115	
Comment:	SH PT		ARMHOLE NOTCH		ARMHOLE SS PT	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	0.25	-0.12	0.00	-0.12	0.00	-0.25
2 -4	0.25	-0.12	0.00	-0.12	0.00	-0.25
4 -6	0.25	-0.12	0.00	-0.12	0.00	-0.25
6 -8	0.25	-0.12	0.00	-0.12	0.00	-0.25
8 -10	0.25	-0.25	0.00	-0.25	0.00	-0.38
10 -12	0.25	-0.25	0.00	-0.25	0.00	-0.38
Number:	116		117		118	
Comment:	SS WAIST PT		WAISTL DART		CF WAIST PT	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	-0.12	-0.25	-0.12	-0.12	-0.12	0.00
2 -4	-0.12	-0.25	-0.12	-0.12	-0.12	0.00
4 -6	-0.12	-0.25	-0.12	-0.12	-0.12	0.00
6 -8	-0.12	-0.25	-0.12	-0.12	-0.12	0.00
8 -10	-0.12	-0.38	-0.12	-0.12	-0.12	0.00
10 -12	-0.12	-0.38	-0.12	-0.12	-0.12	0.00
Number:	119		150		151	
Comment:	SS FROM WST TO HIP		UPPER PT TORSO DRT		WASIT PT TORSO DRT	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	-0.12	0.19	0.00	0.12	-0.12	0.12
2 -4	-0.12	0.19	0.00	0.12	-0.12	0.12
4 -6	-0.12	0.19	0.00	0.12	-0.12	0.12
6 -8	-0.12	0.19	0.00	0.12	-0.12	0.12
8 -10	-0.25	0.25	0.00	0.19	-0.12	0.19
10 -12	-0.25	0.25	0.00	0.19	-0.12	0.19
Number:	152		201		202	
Comment:	LOWER PT TORSO DRT		SH PT AT SLV CAP		D NOTCH SLV CAP	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	-0.38	0.12	0.12	0.00	0.06	0.06
2 -4	-0.38	0.12	0.12	0.00	0.06	0.06
4 -6	-0.38	0.12	0.12	0.00	0.06	0.06
6 -8	-0.38	0.12	0.12	0.00	0.06	0.06
8 -10	-0.38	0.19	0.12	0.00	0.06	0.06
10 -12	-0.38	0.19	0.12	0.00	0.06	0.06
Number:	203		204		205	
Comment:	B ARMH AT SS PT		B ELB DART AT SS		B SS AT WRIST	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	0.00	0.19	-0.12	0.19	-0.25	0.12

Number:	203	204	205			
Comment:	B ARMH AT SS PT	B ELB DART AT SS	B SS AT WRIST			
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
2 -4	0.00	0.19	-0.12	0.19	-0.25	0.12
4 -6	0.00	0.19	-0.12	0.19	-0.25	0.12
6 -8	0.00	0.19	-0.12	0.19	-0.25	0.12
8 -10	0.00	0.19	-0.12	0.19	-0.25	0.12
10 -12	0.00	0.19	-0.12	0.19	-0.25	0.12
Number:	206	207	208			
Comment:	CTR WRIST AT GRAIN	FT SS AT WRIST	FT ELBOW AT SS			
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	-0.25	0.00	-0.25	-0.12	-0.12	-0.19
2 -4	-0.25	0.00	-0.25	-0.12	-0.12	-0.19
4 -6	-0.25	0.00	-0.25	-0.12	-0.12	-0.19
6 -8	-0.25	0.00	-0.25	-0.12	-0.12	-0.19
8 -10	-0.25	0.00	-0.25	-0.12	-0.12	-0.19
10 -12	-0.25	0.00	-0.25	-0.12	-0.12	-0.19
Number:	209	210	220			
Comment:	FT ARMH AT SS	S NOTCH IN FT ARMH	DROP SH CUFF			
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	0.00	-0.19	0.06	-0.06	0.59	0.00
2 -4	0.00	-0.19	0.06	-0.06	0.75	0.00
4 -6	0.00	-0.19	0.06	-0.06	0.50	0.00
6 -8	0.00	-0.19	0.06	-0.06	0.63	0.00
8 -10	0.00	-0.19	0.06	-0.06	0.38	0.00
10 -12	0.00	-0.19	0.06	-0.06	0.50	0.00
Number:	301	302	303			
Comment:	CF WAIST PT	SINGLE WAIST DART	WAIST SS PT			
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	0.25	0.00	0.25	0.12	0.25	0.25
2 -4	0.25	0.00	0.25	0.12	0.25	0.25
4 -6	0.25	0.00	0.25	0.12	0.25	0.25
6 -8	0.25	0.00	0.25	0.12	0.25	0.25
8 -10	0.25	0.00	0.25	0.12	0.25	0.38
10 -12	0.25	0.00	0.25	0.12	0.25	0.38
Number:	304	305	306			
Comment:	SS AT HIP PT	SS AT KNEE PT	SKT SS AT FLOOR PT			
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	0.00	0.25	-0.12	0.25	-0.25	0.25
2 -4	0.00	0.25	-0.12	0.25	-0.25	0.25
4 -6	0.00	0.25	-0.12	0.25	-0.25	0.25
6 -8	0.00	0.25	-0.12	0.25	-0.25	0.25
8 -10	0.00	0.38	-0.12	0.38	-0.25	0.38
10 -12	0.00	0.38	-0.12	0.38	-0.25	0.38

Number:	307		308		309	
Comment:	PANT SS AT ANKL E		CF/INSEAM AT ANKLE		CF SKT AT KNEE	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	-0.25	0.12	-0.25	-0.12	-0.12	0.00
2 -4	-0.25	0.12	-0.25	-0.12	-0.12	0.00
4 -6	-0.25	0.12	-0.25	-0.12	-0.12	0.00
6 -8	-0.25	0.12	-0.25	-0.12	-0.12	0.00
8 -10	-0.25	0.25	-0.25	-0.25	-0.12	0.00
10 -12	-0.25	0.25	-0.25	-0.25	-0.12	0.00
Number:	310		311		312	
Comment:	INSEAM AT CROT CH		SINGLE WAIST DART		INSIDE DART AT WST	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	0.00	-0.12	0.25	-0.12	0.25	0.06
2 -4	0.00	-0.12	0.25	-0.12	0.25	0.06
4 -6	0.00	-0.12	0.25	-0.12	0.25	0.06
6 -8	0.00	-0.12	0.25	-0.12	0.25	0.06
8 -10	0.00	-0.12	0.25	-0.12	0.25	0.06
10 -12	0.00	-0.12	0.25	-0.12	0.25	0.06
Number:	313		314		315	
Comment:	OUTS DART AT WAIST		WAIST SS PT		SS AT HIP PT	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	0.25	0.12	0.25	-0.25	0.00	-0.25
2 -4	0.25	0.12	0.25	-0.25	0.00	-0.25
4 -6	0.25	0.12	0.25	-0.25	0.00	-0.25
6 -8	0.25	0.12	0.25	-0.25	0.00	-0.25
8 -10	0.25	0.12	0.25	-0.38	0.00	-0.38
10 -12	0.25	0.12	0.25	-0.38	0.00	-0.38
Number:	316		317		321	
Comment:	SS AT KNEE PT		SKT SS AT FLOOR PT		WAIST #1 SS NOT CH	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	-0.12	-0.25	-0.25	-0.25	0.25	0.00
2 -4	-0.12	-0.25	-0.25	-0.25	0.25	0.00
4 -6	-0.12	-0.25	-0.25	-0.25	0.25	0.00
6 -8	-0.12	-0.25	-0.25	-0.25	0.25	0.00
8 -10	-0.12	-0.38	-0.25	-0.38	0.38	0.00
10 -12	-0.12	-0.38	-0.25	-0.38	0.38	0.00
Number:	322		323		324	
Comment:	WAIST CF/CB NOT CH		WAIST #2 SS NOT CH		WAIST #2 CF/CB NOT	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	0.50	0.00	0.75	0.00	1.00	0.00
2 -4	0.50	0.00	0.75	0.00	1.00	0.00
4 -6	0.50	0.00	0.75	0.00	1.00	0.00
6 -8	0.50	0.00	0.75	0.00	1.00	0.00
8 -10	0.75	0.00	1.12	0.00	1.50	0.00
10 -12	0.75	0.00	1.12	0.00	1.50	0.00

Number:	350		351		352	
Comment:	TORSO SS HIP		TORSO SS KNEE		TORSO CF/CB HEM	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	-0.38	0.25	-0.25	0.25	-0.25	0.00
2 -4	-0.38	0.25	-0.25	0.25	-0.25	0.00
4 -6	-0.38	0.25	-0.25	0.25	-0.25	0.00
6 -8	-0.38	0.25	-0.25	0.13	-0.25	0.00
8 -10	-0.38	0.38	-0.25	0.13	-0.25	0.00
10 -12	-0.38	0.38	-0.25	0.13	-0.25	0.00
Number:	353		354		402	
Comment:	TORSO PRINCES S HEM		TORSO CF HIP		COL CB NK	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	-0.50	0.12	0.00	0.00	0.00	0.00
2 -4	-0.50	0.12	0.00	0.00	0.00	0.00
4 -6	-0.50	0.12	0.00	0.00	0.00	0.00
6 -8	-0.50	0.12	0.00	0.00	0.00	0.00
8 -10	-0.50	0.19	0.00	0.00	0.00	0.00
10 -12	-0.50	0.19	0.00	0.00	0.00	0.00
Number:	403		404		405	
Comment:	COL SH NOTCH		COL CF NK		COL CF EDGE	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	0.00	0.12	0.00	0.14	0.00	0.14
2 -4	0.00	0.28	0.00	0.28	0.00	0.28
4 -6	0.00	0.23	0.00	0.23	0.00	0.23
6 -8	0.00	0.30	0.00	0.30	0.00	0.30
8 -10	0.00	0.37	0.00	0.37	0.00	0.37
10 -12	0.00	0.37	0.00	0.37	0.00	0.37
Number:	406		407		501	
Comment:	COL SH EDGE		COL CB EDGE		WAISTB R SS	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	0.00	0.12	0.00	0.00	0.25	0.00
2 -4	0.00	0.12	0.00	0.00	0.25	0.00
4 -6	0.00	0.12	0.00	0.00	0.25	0.00
6 -8	0.00	0.13	0.00	0.00	0.25	0.00
8 -10	0.00	0.18	0.00	0.00	0.38	0.00
10 -12	0.00	0.19	0.00	0.00	0.38	0.00
Number:	502		503		504	
Comment:	WAISTB CF		WAISTB L SS		WAISTB CB	
Point Attribute:						
Size Breaks:	X	Y	X	Y	X	Y
0 -2	0.50	0.00	0.75	0.00	1.00	0.00
2 -4	0.50	0.00	0.75	0.00	1.00	0.00
4 -6	0.50	0.00	0.75	0.00	1.00	0.00
6 -8	0.50	0.00	0.75	0.00	1.00	0.00
8 -10	0.75	0.00	1.12	0.00	1.50	0.00
10 -12	0.75	0.00	1.12	0.00	1.50	0.00
Number:	505					
Comment:	TOROSO WAIST SS PT					
Point Attribute:						
Size Breaks:	X	Y				
0 -2	-0.12	0.25				

Number:
Comment:

505
TOROSO WAIST
SS PT

Point Attribute:
Size Breaks:

2 -4
4 -6
6 -8
8 -10
10 -12

X	Y
-0.12	0.25
-0.12	0.25
-0.12	0.25
-0.12	0.38
-0.12	0.38

Appendix C: Evaluation Tool: Likert-like Scale for Fit and Design Integrity

Garment Evaluation Tool

Evaluator _____

Garment #: _____

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Fitting Area	Ideal Placement					Score
Shoulder Seams	Smooth seam across the top of the shoulder					0
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Bodice Side Seams	Should be perpendicular to the floor					0
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					0
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Gathers						
Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					0
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Back Gathers	Finished gather length should be 2"					0
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Gathers	Finished gather length should be 2.5"					0
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					0
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	

Armhole	There should not be any gaping around the armhole.					0
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					0
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					0
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					0
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	

Overall Fit	How is the overall fit of this garment?					0
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Comments						0

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					0
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Comments						

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					0
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Comments						0

Appendix D: Evaluation Tool: Completed Evaluations

Garment Evaluation Tool

Evaluator A

Garment #: Control

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Fitting Area	Ideal Placement					Score
Shoulder Seams	Smooth seam across the top of the shoulder					10
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Bodice Side Seams	Should be perpendicular to the floor					14
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					15
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Gathers

Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					20
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Back Gathers	Finished gather length should be 2"					15
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Shoulder Gathers	Finished gather length should be 2.5"					12
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					15
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Armhole	There should not be any gaping around the armhole.					15
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					10
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					10
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					8
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Overall Fit	How is the overall fit of this garment?					5
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Comments						137

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					11
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Comments						

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					4
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Comments						15

Evaluator A

Garment #: 1

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garter

	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Fitting Area	Ideal Placement					Score
Shoulder Seams	Smooth seam across the top of the shoulder					4
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Bodice Side Seams	Should be perpendicular to the floor					7
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					11
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Gathers

Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					14
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Back Gathers	Finished gather length should be 2"					5
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Shoulder Gathers	Finished gather length should be 2.5"					7
Shoulder Gather Uptake+	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Shoulder Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Shoulder Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					13
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Armhole	There should not be any gaping around the armhole.					11
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					3
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					6
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					10
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Overall Fit	How is the overall fit of this garment?					3
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Comments						87

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					8
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Comments						

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					3
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Comments						11

Garment Evaluation Tool

Evaluator A

Garment #: 2

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

Fitting Area	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
	Ideal Placement					Score
Shoulder Seams	Smooth seam across the top of the shoulder					4
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Bodice Side Seams	Should be perpendicular to the floor					10
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					8
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Gathers

Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					11
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Back Gathers	Finished gather length should be 2"					11
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Shoulder Gathers	Finished gather length should be 2.5"					8
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					11
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Armhole	There should not be any gaping around the armhole.					10
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					4
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					7
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					8
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Overall Fit	How is the overall fit of this garment?					2
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Comments						86

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					9
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Comments						

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					2
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Comments	The added pockets and band at the bottom of the skirt add visual interest, but my eye is drawn to the gap between the bust and the twisting of the skirt					11

Garment Evaluation Tool

Evaluator A

Garment #: 3

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

Fitting Area	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
	Ideal Placement					Score
Shoulder Seams	Smooth seam across the top of the shoulder					3
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Bodice Side Seams	Should be perpendicular to the floor					9
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					8
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Gathers

Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					9
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Back Gathers	Finished gather length should be 2"					11
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Shoulder Gathers	Finished gather length should be 2.5"					11
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					4
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Armhole	There should not be any gaping around the armhole.					11
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					2
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					8
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					6
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Overall Fit	How is the overall fit of this garment?					2
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Comments						73

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					7
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Comments						

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					1
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Comments	Lots of gaping at the center front between the busts and the neckline unevenness is very distracting					8

Garment Evaluation Tool

Evaluator A

Garment #: 4

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Seams	Smooth seam across the top of the shoulder					10
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Bodice Side Seams	Should be perpendicular to the floor					6
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					7
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Gathers

Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					10
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Back Gathers	Finished gather length should be 2"					10
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Shoulder Gathers	Finished gather length should be 2.5"					12
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					4
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Armhole	There should not be any gaping around the armhole.					10
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					8
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					10
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					10
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Overall Fit	How is the overall fit of this garment?					3
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Comments						88

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					10
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Comments						

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					4
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Comments	Proportionally looks better, but my eye is still drawn to the gap at the center front bust.					14

Garment Evaluation Tool

Evaluator A

Garment #: 5

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Seams	Smooth seam across the top of the shoulder					2
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Bodice Side Seams	Should be perpendicular to the floor					5
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					5
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Gathers

Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					7
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Back Gathers	Finished gather length should be 2"					5
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Shoulder Gathers	Finished gather length should be 2.5"					10
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					3
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Armhole	There should not be any gaping around the armhole.					6
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					6
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					8
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					6
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Overall Fit	How is the overall fit of this garment?					1
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Comments						54

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					5
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Comments						

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					1
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Comments	Very ill- fitting, and the unfinished hem border is distracting.					6

Garment Evaluation Tool

Evaluator B

Garment #: Control

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Seams	Smooth seam across the top of the shoulder					7
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Bodice Side Seams	Should be perpendicular to the floor					11.5
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3.5

Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					11
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Gathers

Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					16
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Back Gathers	Finished gather length should be 2"					12
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Shoulder Gathers	Finished gather length should be 2.5"					6
Shoulder Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Shoulder Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Shoulder Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					12
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Armhole	There should not be any gaping around the armhole.					6
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					8
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					7
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					8
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Overall Fit	How is the overall fit of this garment?					3.5
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3.5
Comments	Upper body is over sized with lower body slightly smaller, the smooth muslin and its light color, is a better quality so it gives the appearance of cleaner cut.					102

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					8
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Comments						

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					0
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Comments	The zipper is broken, top shoulder sleeves are in pressed and do not lay flat. Grading of top and bottom are in consistent.					8

Garment Evaluation Tool

Evaluator B

Garment #: 1

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garter

Fitting Area	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Ideal Placement						Score
Shoulder Seams	Smooth seam across the top of the shoulder					3.5
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1.5

Bodice Side Seams	Should be perpendicular to the floor					5
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					7
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Gathers

Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					8
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Back Gathers	Finished gather length should be 2"					9
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Shoulder Gathers	Finished gather length should be 2.5"					4
Shoulder Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Shoulder Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Shoulder Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					3
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Armhole	There should not be any gaping around the armhole.					3
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					6
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					3
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					8
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Overall Fit	How is the overall fit of this garment?					1
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Comments	Garment is not symmetric					56.5

Section 2: Design

Design Element	Ideal Aesthetic	Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.	3
Silhouette	very good - 5 good - 4 fair - 3 poor - 2 very poor - 1	1
Line	very good - 5 good - 4 fair - 3 poor - 2 very poor - 1	1
Proportion	very good - 5 good - 4 fair - 3 poor - 2 very poor - 1	1
Comments	Matching seams are visible in the front hem, distracting segment in CB waist band, and through front was it band seam line.	

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					1
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Comments	Garment has bulky seams, that are not pressed.					4

Garment Evaluation Tool

Evaluator B

Garment #: 2

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Seams	Smooth seam across the top of the shoulder					5
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Bodice Side Seams	Should be perpendicular to the floor					5
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					6
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Gathers

Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					4
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Back Gathers	Finished gather length should be 2"					9
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Shoulder Gathers	Finished gather length should be 2.5"					3
Shoulder Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Shoulder Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Shoulder Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					7
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Armhole	There should not be any gaping around the armhole.					5
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					5
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					6
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					6
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Overall Fit	How is the overall fit of this garment?					3
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Comments						61

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					3
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Comments	Same comments as before, as this looks at better fit than dress two, the pockets look misplaced, center back seam is distrctrating. Miss matched center front seam and waist, with visible seam line. In complete stitching on neckline. Hugh gapping between bust. symmtrv of armholes is off.					
Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					1
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Comments	They are distracting, and this would be amplified if this was in a print or patterned fabric, mixing pockets with side seam and gathered waits, look bulky.					4

Garment Evaluation Tool

Evaluator B

Garment #: 3

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Seams	Smooth seam across the top of the shoulder					2
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Bodice Side Seams	Should be perpendicular to the floor					3
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					3
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Gathers

Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					10
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Back Gathers	Finished gather length should be 2"					3
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Shoulder Gathers	Finished gather length should be 2.5"					3
Shoulder Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Shoulder Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Shoulder Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Garment Evaluation Tool

Evaluator B

Garment #: 4

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Seams	Smooth seam across the top of the shoulder					2
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Bodice Side Seams	Should be perpendicular to the floor					9
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					11
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3.5
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3.5

Gathers

Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					12
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Back Gathers	Finished gather length should be 2"					6
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2

Shoulder Gathers	Finished gather length should be 2.5"					5
Shoulder Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Shoulder Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Shoulder Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					7.5
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2.5
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2.5
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2.5

Armhole	There should not be any gaping around the armhole.					7.5
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2.5

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					8
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					7
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					8.5
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4.5
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Overall Fit	How is the overall fit of this garment?					2
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Comments	The top is still huge, but it seems better proportioned than the other examples. The gathering on the skirt waist looks to be uneven.					80.5

Section 2: Design

Design Element	Ideal Aesthetic	Score				
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.	4				
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Comments	Hem band looks distracting and cuts the line of the garment					

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					1
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Comments	Distracting center front seam on was it band, unfinished and un symmetrical neckline, all thus far examples had an even placement of gathers on the shoulder, one started about an inch away, the other started at the neckline. Distracting center back rectangle.					1

Garment Evaluation Tool

Evaluator B

Garment #: 5

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Seams	Smooth seam across the top of the shoulder					2
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Bodice Side Seams	Should be perpendicular to the floor					3
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					3
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Gathers

Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					4
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Back Gathers	Finished gather length should be 2"					3
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Shoulder Gathers	Finished gather length should be 2.5"					3
Shoulder Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Shoulder Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Shoulder Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					3
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Armhole	There should not be any gaping around the armhole.					3
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					2
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					2
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					2
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1

Overall Fit	How is the overall fit of this garment?					1
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Comments						28

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					3
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Comments	Same as before comments, distracting, hem line, distracting rectangle in center back, miss placed center back match seam should have been placed on side, unfinished un symmetrical neckline.					

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					1
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	1
Comments	If I could have graded negatively I would have.					1

Garment Evaluation Tool

Evaluator C

Garment #: control

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 gartner

	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Fitting Area	Ideal Placement					Score
Shoulder Seams	Smooth seam across the top of the shoulder					9
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Bodice Side Seams	Should be perpendicular to the floor					15
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					15
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Gathers						
Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					20
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Gathers	Finished gather length should be 2"					15
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Gathers	Finished gather length should be 2.5"					14
Shoulder Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					15
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Armhole	There should not be any gaping around the armhole.					15
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					10
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					10
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					9
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Overall Fit	How is the overall fit of this garment?					5
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Comments						138

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					15
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Comments						

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					5
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Comments						20

Garment Evaluation Tool

Evaluator C

Garment #: 1

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garter

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Seams	Smooth seam across the top of the shoulder					9
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Bodice Side Seams	Should be perpendicular to the floor					15
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					10
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3

Gathers

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					15
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Back Gathers	Finished gather length should be 2"					15
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Gathers	Finished gather length should be 2.5"					12
Shoulder Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Shoulder Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Shoulder Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					15
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Armhole	There should not be any gaping around the armhole.					15
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					10
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					10
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					10
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Overall Fit	How is the overall fit of this garment?					4
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Comments						128

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					12
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Comments						

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					4
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Comments	the waist band is a little wide. There is a lot of gathering at the waist below the waist band. It looks like some excess fabric from the arm holes to the waist band. Overall I am impressed that this is a no waist garment.					16

Garment Evaluation Tool

Evaluator C

Garment #: 2

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Seams	Smooth seam across the top of the shoulder					9
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Bodice Side Seams	Should be perpendicular to the floor					15
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					15
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Gathers

Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					20
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Back Gathers	Finished gather length should be 2"					15
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Shoulder Gathers	Finished gather length should be 2.5"					14
Shoulder Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					15
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Armhole	There should not be any gaping around the armhole.					15
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					10
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					10
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					10
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Overall Fit	How is the overall fit of this garment?					5
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Comments						139

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					10
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Comments	The waist band seems wide in the front					

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					4
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Comments	Dress 3 lays differently than dress 1. Not as slimming					14

Garment Evaluation Tool

Evaluator C

Garment #: 3

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Seams	Smooth seam across the top of the shoulder					10
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Bodice Side Seams	Should be perpendicular to the floor					15
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					15
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Gathers

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					20
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Back Gathers	Finished gather length should be 2"					15
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Gathers	Finished gather length should be 2.5"					15
Shoulder Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					15
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Armhole	There should not be any gaping around the armhole.					15
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					10
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					9
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					9
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Overall Fit	How is the overall fit of this garment?					0
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Comments	Waist circumference appears to be a little narrow. The silhouette for a size 12 dress is super adorable. The skirt length seems short.					133

Section 2: Design

Design Element	Ideal Aesthetic	Score				
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.	14				
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Comments						

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					5
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Comments						19

Garment Evaluation Tool

Evaluator C

Garment #: 4

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Fitting Area	Ideal Placement					Score
Shoulder Seams	Smooth seam across the top of the shoulder					8
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Bodice Side Seams	Should be perpendicular to the floor					15
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					15
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Gathers						
Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					19
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Gathers	Finished gather length should be 2"					15
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Gathers	Finished gather length should be 2.5"					14
Shoulder Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					15
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Armhole	There should not be any gaping around the armhole.					15
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					10
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					10
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					10
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Overall Fit	How is the overall fit of this garment?					5
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Comments	This dress seems very similar to dress #2. However, the garment appears to have better drape and is more appealing for the figure.					137

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					15
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Comments						

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					5
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Comments						20

Garment Evaluation Tool

Evaluator C

Garment #: 5

Section 1: Fit

Please rate the following design elements on how closely each specified element resembles the base size 8 garment

Fitting Area	Ideal Placement					Score
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	
Shoulder Seams	Smooth seam across the top of the shoulder					6
Shoulder Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	2
Shoulder Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4

Bodice Side Seams	Should be perpendicular to the floor					15
Bodice Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bodice Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bodice Side Seam Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Waistband	The bottom of the waistband should rest at the natural waist line and should be parallel to the floor. It should fit close to the body but should not hold in or restrict the body in any way.					12
Waistband Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Front Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Back Waistband Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Gathers

Bust Gathers	Finished gather length should be 2" and create enough fullness to accommodate the bust.					19
Front Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bust Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Bust Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Total Bust Circumference (Ease)	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Back Gathers	Finished gather length should be 2"					15
Back Bodice Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Bodice Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Back Bodice Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Shoulder Gathers	Finished gather length should be 2.5"					15
Shoulder Gather Uptake	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Gather Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Shoulder Gather Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Neck Opening	Should lay flat around the neckline and have enough opening to pull over the head.					15
Neckline Height at Center Front	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Height at Center Back	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Neckline Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Armhole	There should not be any gaping around the armhole.					15
Armhole Level	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Armhole Ease	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Armhole Fit Overall	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Side Seams	Should be perpendicular to the floor and start from the side of the waist to the hem.					10
Skirt Side Seam Position	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Side Seam Angle	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Width at Waist	It should fit close to the body but should not hold in or restrict the body in any way.					8
Total Waist Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Total Hip Circumference	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Skirt Length	Skirt length should fall to the knee and hem line should be parallel to the floor.					10
Skirt Length	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5
Skirt Hem balance	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	5

Overall Fit	How is the overall fit of this garment?					3
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Comments	The waist and bust area not as appealing as the other size 12 dress					128

Section 2: Design

Design Element	Ideal Aesthetic					Score
	The shape of the garment complements the body and resembles the silhouette, lines and proportion of the base garment.					11
Silhouette	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Line	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Proportion	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	4
Comments						

Overall Design	How is the overall design of this garment? In your opinion, do the variations in each test garment add or detract from the initial design (control garment)?					3
	very good - 5	good - 4	fair - 3	poor - 2	very poor - 1	3
Comments						14