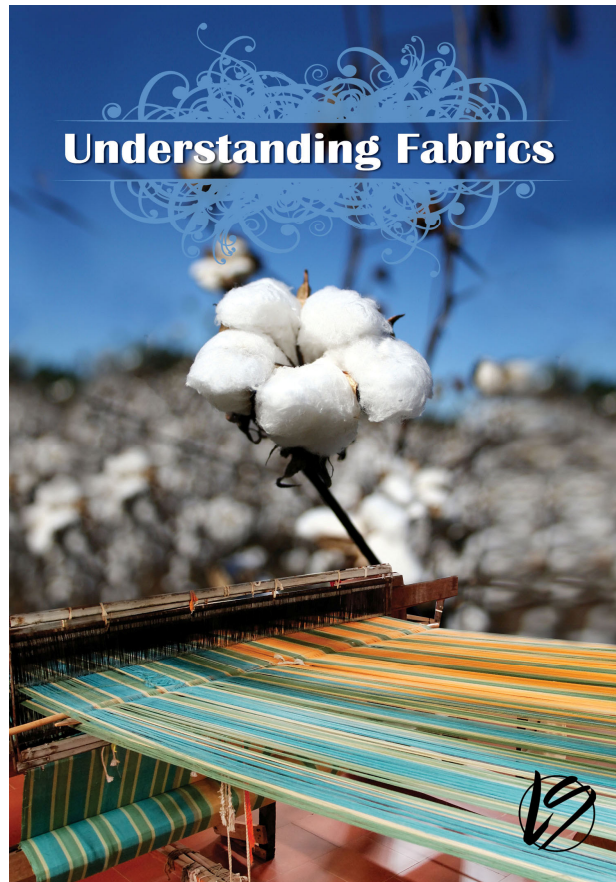


Understanding Fabrics



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Understanding Fabrics

A Guide to Understanding Fabrics

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Credits

The Video

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This Teaching Guide

Compilation: Rebecca J. Phipps
Copy Editor: Jennifer Smith

Learning Seed Catalog and ISBN Numbers

DVD LS-1166-08-DVD ISBN 1-55740-522-0
VHS LS-1166-08-VHS ISBN 1-55740-521-2

Closed Captioning

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The Program

Summary

With this invention, you can soar like a bird, mend a broken heart, stop a speeding bullet, protect flesh from fatal burns, and even hold off the vacuum of outer space. What is this flexible and sometimes miraculous device? Fabric.

Fabric is cloth made by weaving, knitting, or felting fibers. We use fabric most often to make clothing, from basic coverings to high performance sportswear. Fabric covers furniture, too. Upholstery fabrics can retain their color despite sun exposure, easily repel stains and moisture, and stand up to whatever dogs and kids can inflict. Even hoses under the hood of your car are made of fabric. We even use fabric as architecture, to shield us from the sun. What is fabric? How is it made? What are the kinds of fabric, and how are they different from one another?

In this program we will learn what fabric is; how it is made through felting, weaving and knitting; how advances in technology have allowed us to manufacture fibers in laboratories; why fibers are sometimes blended to make fabric; and how fabric is finished in preparation for use.

What is Fabric?

The word "textile" comes from the Latin "texere", "to weave." It originally meant a fabric made from woven fibers. Today, the word "textile" includes fabrics produced by felting, weaving, knitting, and knotting fibers. It also refers to manmade fabrics which may be produced by other methods.

How is Fabric Made?

Most fabric is made from fibers. Fibers are simply long thin strands of various materials. Some fibers are natural. They come from plants like cotton or flax, a silk worm's cocoon, the leaves of pineapple plants, or from animals, like sheep or even camels. Before natural fibers can be used to make fabric, they must be harvested and cleaned. Other fibers are manufactured. These include nylon, polyester, and rayon, and other brand name fibers.

Felt

Felt is one of the oldest known fabrics. Felt is a non-woven fabric made by matting and condensing fibers. It can be thought of as a two-part system. Woolen fibers are generally used to make felt. The raw fiber is first prepared by washing or boiling. High quality felt is made from 70-100% wool, inexpensive felt is made of 70% synthetic fibers and 30% wool or 100% acrylic. Next, the wet fibers are pressed together while being heated. The combination of moisture, heat, and pressure shrinks the fibers, and bonds them together to form a dense mat.

Woven Fabrics

Most fabrics are woven. Woven fabric can be thought of as a three-part system. First fibers are made into yarn, then the yarn is woven in various ways to become fabric. Let's see how it works.

First, bundles of fibers are **carded**. **Carding** is the process of taking rough, raw fibers and detangling and straightening them. It's much like combing tangled hair. To card fibers, short strands of fiber - called **staples** - are combed so the fibers run the same direction. Before steel combs were invented, a **thistle** plant was used to comb the fibers. This process of combing fibers is called carding, after the Latin word for thistle. Carding wool or cotton by hand was tedious, so the **water-powered carding machine** marked a major advance. It passes the fibers over a series of wheels covered with wire bristles.

After carding, the short fibers are combined into long yarns in a process called "**spinning**." Natural fibers like wool or cotton are twisted together. This adds strength and hold to the fiber. Originally spinning was done by hand, or with a stick called a spindle. Later, the **spinning wheel** made yarn production a faster and more continuous process.

Weaving

We've taken our fibers - cleaned, straightened and spun them into yarn. Now, to make fabric we must weave the yarn together. Weaving means passing yarns **over** and **under** other yarns to create fabric. The lengthwise yarns are called the **warp**. In weaving, the long warp yarns are pulled tight, and form the **foundation** of the fabric. Cross-wise yarns are the **weft**, or filling; these are the "action" yarns that are woven over and under the warp yarns. A woven fabric's **bias** is the diagonal line that is created by the intersection of the warp and weft yarns. It is sometimes called the cross grain. A woven fabric is most elastic in the bias direction. If a garment is "**cut on the bias**", this means that the fabric's warp and weft threads are at **45 degrees**. This utilizes the **stretch** of the fabric and creates a garment that drapes softly.

Another aspect of woven fabric is the **selvage**. This is the uncut, finished edge of the fabric. The weft threads here double back on themselves so they will not fray. This area is often cut off or folded over in a hem.

Weaving yarns over and under, thousands of times by hand is slow and tedious. So looms speed weaving considerably. How do looms work? The warp yarns are stretched tight by the frame of the loom. To move the weft yarn over and under each warp yarn would be time consuming. But if we mount the warp yarns on two frames – each moveable; then all we have to do is lay the weft yarn across and move the other warp yarns across. But if we mount the warp yarns on two frames – each moveable; then all we have to do is lay the weft yarn across and move the other warp yarns across.

Weaving, like spinning, was originally done at home. Hand looms allow warp threads to be raised and lowered by a foot-operated treadle. A wooden shuttle carries the weft yarns over the warp as it slides across while the harness is raised and lowered. A different shuttle has to be used for each different weft color.

Slowly, weaving became more mechanized by early powered looms. Nineteenth century power looms were controlled by punch cards; an idea later borrowed for the first computers. New machines and the industrial revolution slowly brought fabric making out of the home and into the world of manufacturing. But the process today remains basically the same – yarns interlaced at right angles to create fabrics of great strength, variety, and beauty.

Types of Weaves

There are three kinds of basic weaves: plain, twill, and satin. All of them are **biaxial** weaves, or weaves made from two sets of yarns. Other weaves are variations on or combinations of these three.

The Plain Weave

The plain weave is simplest and least expensive. A yarn goes over one yarn, under the next. The plain weave fabrics include burlap, gingham, and seersucker. Seersucker is derived from a Persian word meaning milk and honey. It's a variation on a plain weave created by holding some warp yarns at a tight tension, others with some slack. The difference in tension causes the wave-like blisters that give the fabric its distinctive texture.

Percal and muslin are both plain weaves and are both are used as bed sheets. But the percale costs much more. Why? Because it has a higher thread count. Thread count measures the number of warp and filling yarns in a given area of unfinished fabric. In standard measurements, it's per square inch; in metric, the yarns are counted per square centimeter. The count is written with the warp number first: 80 by 76. Or it may be written as the total of the two: 156. If the numbers are the same, the fabric is **balanced**. The count may increase as the fabric is processed due to shrinkage during dyeing and finishing. Why is thread count important? More yarns provide more strength, more durability – and a higher cost. Muslin is a coarse fabric with a count between 115 and 140 yarns per square inch. Percale has a thread count between 180 and 350. It has fine smooth feel and is light weight.

The Twill Weave

The second basic weave is a **twill weave**. The weft yarns go under and over two or more warp yarns at regular intervals, creating a diagonal pattern. A diagonal line, also called a twill line or a **wale**, is evident in the finished fabric. Twill is durable yet drapes well. This makes twills ideal for draperies as well as tailored garments.

But blue jeans are also a twill weave made from a fabric called denim. It became popular in the United States for work clothes during the gold rush in California. Denim for blue jeans is made with a blue cotton warp and a white filling yarn. Denim doesn't have to be blue.

The Satin Weave

The third basic weave is satin. Each yarn crosses over four or more other yarns before going under another. The distance the yarn covers is called a "float." Because of these long "floats," and low twist, the satin weave is flat, smooth, and lustrous. That's why it is a popular choice for bed sheets. But long floats also make the weave susceptible to snagging and pulling.

Triaxial Weave

Another, more complex weave is the **triaxial** weave. Here, yarns run in three directions. In addition to the warp and weft, a third set called the **whug** is added. The whug can be thought of as a second warp yarn, which strengthens the fabric. Triaxial weaves are stable in all directions, and are used for industrial products such as balloons and sails.

Knitting

Most fabric is woven, but knitted fabric is also common. Knitting is the interlocking of yarns to form a fabric. Most weaving is based on interlacing yarn at right angles while knitting is based on **looping** yarns together. Knitters use needles to loop yarn through a row of stitches. The rows are connected and very slowly the yarn is turned into a fabric. The knitted loops become stitches when pulled through another loop. The two basic stitches in a simple knitted fabric are a knit and a purl.

Ready made clothes are knitted by machine, not by hand. At a modern manufacturing plant, spools of yarn are fed into circular knitting machines at a pace almost too fast for the eye to follow. Knitting machines have a needle for each loop, so a complete row is made at one time. The knit stitch appears on the "right" or "face" side of the fabric. In a sweater, the "face" side is the side people see when you wear it. The knit stitches form a smooth surface. The purl stitches form a rather bumpy surface, so they appear on the "wrong" or "back" side of the fabric. The loops in a knit give fabric elasticity since they behave like tiny springs when pulled or twisted. That's a quick way to tell a knit from a weave; knits are usually more elastic. Another way is to use a magnifying glass to see the loops in a knit. In general, knits use more yarn than weaving to produce a fabric of the same size. So knitted garments often cost more than comparable woven garments.

Double knits are the product of two sets of needles interlocking two layers of fabric into one. The resulting double-layered knit is stronger than a single knit. Double knit clothing often holds its shape better than single knit.

Finishing

Cloth fresh from the loom is still unfinished. Unfinished woven or knitted fabrics are called **gray goods**.

During the manufacturing processes, sizing may have been added to the warp, or the fabrics may have come in contact with oils and dirt. Therefore, all gray goods must first be cleaned. After cleaning, many fabrics are then **singed** by passing the fabric through two gas flame bars or hot plates to remove fiber ends that may be sticking up from the surface. This ensures even color and prevents pilling.

Fabrics made of natural fibers, particularly cotton, are bleached to remove color impurities.

Fluorescent whitening compounds called **optical brighteners** may also be added in fabrics where bleach may not be effective.

Some cottons, linen, and rayons may be **Mercerized**. This process treats the fabric with alkali to increase luster and softness, strengthen the fabric, and improve its ability to accept dye.

Dying

The most common finish is to add color by dyeing. To dye fabric by the bolt or roll is called piece dyeing. Dye is applied to fabric via hot water, steam or dry heat. The method is determined by the fabric's fiber content, weight, dye, and desired outcome.

Fabrics are dyed by one of three methods: circulating the fabric through a dye bath, circulating the dye bath around the fabric, or circulating both the dye and the fabric together.

Printing

These fabrics are examples of **prints**. The design is printed on them much like printing on paper. An advanced rotary printer silk-screens this fabric.

Some finishing is functional - finishes may be applied to prevent wrinkling or to make the fabric stain-resistant.

Many finishes are for aesthetic purposes - chintz and polished cotton are glazed simply to make the fabric shiny.

Finishes can also alter the fabrics' texture. Polartec fabric goes through a napping process. Millions of tiny needles raise the surface of the cloth and creates the lofty pile that gives fabric a three-dimensional surface.

Finishes may affect the fabric's **hand**, or how it feels. Stonewashed denim is tumbled with pumice or other abrasive material.

Finally, all fabric is dried, inspected, and then wound on bolts ready for market.

Blended Fabrics

You have most likely noticed a label like this one on your clothing that indicates a blending of fibers. Why blend? There are various reasons including performance, texture, and color effects.

Performance of a fabric refers to qualities like durability, resistance to abrasion, and absorbency. When nylon or polyester is blended with cotton or wool, they increase a fabric's durability while maintaining the appearance of the natural fibers. Manufacturers can also control the absorbency of fabrics by blending them together. Fabrics are sometimes blended to create a desired texture. For example, a small amount of rayon can be blended with cotton to give the fabric sheen and add softness. Sometimes fibers of different composition, color, and length are spun into one yarn. These are called intimate blend yarns. Intimate blend yarns are created to improve spinning efficiency and uniformity, or to get the most out of expensive fibers by blending them with less expensive fibers.

Interactive Element

Scavenger Hunt

Divide the class into small groups and allow each group one to several days to gather as many items on the list as possible.

The purpose of the scavenger hunt is to encourage students to look closely at fabrics and their descriptions. Only fabrics or pictures of fabrics are acceptable with the exception of item ten. Item ten requires students find a term in print in an ad, label, or clothing catalog. Mail order catalogs in which these terms are likely to be found include L.L. Bean, Huntington Clothiers, Smith & Hawken, Talbot's, and dozens more.

The items in boldface will require further research to identify.

Drill is a durable fabric much like denim, but heavier.

Henrietta is a twill weave that imitates cashmere. Henrietta is a very soft fabric that drapes well.

Faille is a plain weave fabric using heavier yarns in the weft than in the warp, creating diagonal ribs. Faille is lustrous and often made of silk, rayon, or acetate.

Birdseye is a fabric made of twisted threads. It is also called diaper cloth. Birdseye has a design, often geometric with a dot at the center, resembling the eye of a bird. Birdseye also is found with diamond designs.

A fabric made of **Tussah** - Tussah is wild silk.

A fabric made of a long-chain synthetic polyamide in which less than 85% of the amide-linkages are attached directly to two aromatic rings - This is a technical description of nylon. Students can "translate" the sentence by looking up the word "polyamide" in a dictionary.

Fabric Scavenger Hunt

Your group should find as many examples of the listed fabrics as possible. The team scoring the most points wins. Points are awarded only for an actual sample of the fabric or a very clear picture leaving no doubt the fabric is correct. 100 points is a perfect, but unlikely, score.

A few of the items on this list are "tie breakers." They are fabrics not mentioned in the video or the fabric dictionary. Tie breakers will be especially difficult to find and are noted here by boldface type.

1. One point each. (3 points maximum)

Find a plain weave, a twill weave, and a satin weave.

2. Two points each (6 points maximum)

Find examples of fabrics that are not made to be worn sat on, stood on, or cleaned with.

3. Two points each (6 point maximum)

Find examples of fabrics that are NOT woven or knitted.

4. One point each (2 point maximum)

Find examples of fabrics with printed patterns or designs.

5. One point each (2 point maximum)

Find examples of fabrics with patterns or designs created by weaving.

6. Two points for each of the following: (20 points max)

seersucker

calico

drill

percale

tweed

taffeta

henrietta

flannel

oxford

sateen

7. Two points for each of the following knits: (maximum 10 points)

jersey knit

interlock

double knit

tricot

birdseye

8. Three points for each (maximum 18 points)

A percale fabric with a thread count more than 180

A fabric with a thread count less than 120

A film and a fiber made from the same raw materials

A wool woven in a herringbone twill

A denim fabric with no blue color

A selvage

9. Three points each (15 maximum)

A fabric made of aramid

A fabric made of tussah

A fabric woven from flax

A fabric made of polyester microfibers

A fabric made of a long-chain synthetic polyamide in which less than 85% of the amide-linkages are attached directly to two aromatic rings.

10. One point each (maximum 18) for clothing labels, advertisements, or text in a catalog (for example, a mail order company such as L.L. Bean) describing clothing that contains any of the following phrases. Note: for this section you need not find the actual item or a picture, the words in print are acceptable. The word or phrase must be on a label or an ad or catalog selling clothing or other goods made of fabric. The words in a book, encyclopedia, or dictionary are not acceptable.

combed cotton

madras

chino

broadcloth

worsted wool

14 ounce denim

handknit

interlock knit

canvas

long staple

cotton mesh

chambray

jersey knit

pinpoint oxford cotton

poplin

gabardine

tattersall

spandex

Evaluation/Testing

Vocabulary Worksheet

Match the words in the word bank with the definitions. Some words may be used more than once.

Word Bank

Bias	Carding	Felt	Float	Gray goods	Hand	Knitting
Loom	Mercerized	Muslin	Optical brighteners	Percalé	Plain weave	Seersucker
Selvage	Spindle	Staples	Stitches	Thread count	Triaxial weave	Twill weave
Wale	Warp	Weaving	Weft			

- _____ The foundation of the fabric.
- _____ The process of taking rough, raw fibers and detangling and straightening them.
- _____ How a fabric feels.
- _____ The weft yarns go under and over two or more warp yarns at regular intervals, creating a diagonal pattern.
- _____ Persian word meaning milk and honey.
- _____ Fluorescent whitening compounds.
- _____ The distance the yarn covers.
- _____ The weave in which yarns run in three directions.
- _____ Unfinished woven or knitted fabrics.
- _____ A coarse fabric with a count between 115 and 140 yarns per square inch.
- _____ The loops made by knitting needles.
- _____ Measures the number of warp and filling yarns in a given area of unfinished fabric.
- _____ The uncut, finished edge of the fabric.
- _____ Simplest and least expensive weave.
- _____ The diagonal line that is created by the intersection of the warp and weft yarns.
- _____ A stick used in making yarn.
- _____ Short strands of fiber.
- _____ Based on looping yarns together.

- _____ A machine which weaves yarns together to make fabric.
- _____ The diagonal line created in the twill weave.
- _____ Has a thread count between 180 and 350.
- _____ 80 X 76 or 156.
- _____ Lengthwise yarns.
- _____ Means passing yarns over and under other yarns to create fabric.
- _____ Cross-wise yarns.
- _____ Process that treats the fabric with alkali to increase luster and softness, strengthen the fabric, and improve its ability to accept dye.
- _____ A nonwoven fabric.

Vocabulary Worksheet Answer Key

Word Bank

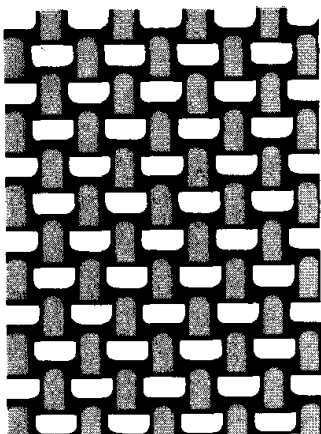
Bias	Carding	Felt	Float	Gray goods	Hand	Knitting
Loom	Mercerized	Muslin	Optical brighteners	Percal	Plain weave	Seersucker
Selvage	Spindle	Staples	Stitches	Thread count	Triaxial weave	Twill weave
Wale	Warp	Weaving	Weft			

<u>Warp</u>	The foundation of the fabric.
<u>Carding</u>	The process of taking rough, raw fibers and detangling and straightening them.
<u>Hand</u>	How a fabric feels.
<u>Twill weave</u>	The weft yarns go under and over two or more warp yarns at regular intervals, creating a diagonal pattern.
<u>Seersucker</u>	Persian word meaning milk and honey.
<u>Optical brighteners</u>	Fluorescent whitening compounds.
<u>Float</u>	The distance the yarn covers.
<u>Triaxial</u>	The weave in which yarns run in three directions.
<u>Gray goods</u>	Unfinished woven or knitted fabrics.
<u>Muslin</u>	A coarse fabric with a count between 115 and 140 yarns per square inch.
<u>Stitches</u>	The loops made by knitting needles.
<u>Thread count</u>	Measures the number of warp and filling yarns in a given area of unfinished fabric.
<u>Selvage</u>	The uncut, finished edge of the fabric.
<u>Plain weave</u>	Simplest and least expensive weave.
<u>Bias</u>	The diagonal line that is created by the intersection of the warp and weft yarns.
<u>Spindle</u>	A stick used in making yarn.
<u>Staples</u>	Short strands of fiber.
<u>Knitting</u>	Based on looping yarns together.
<u>Loom</u>	A machine which weaves yarns together to make fabric.
<u>Wale</u>	The diagonal line created in the twill weave.
<u>Percal</u>	Has a thread count between 180 and 350.
<u>Thread count</u>	80 X 76 or 156.
<u>Warp</u>	Lengthwise yarns.
<u>Weaving</u>	Means passing yarns over and under other yarns to create fabric.
<u>Weft</u>	Cross-wise yarns.
<u>Mercerized</u>	Process that treats the fabric with alkali to increase luster and softness, strengthen the fabric, and improve its ability to accept dye.
<u>Felt</u>	A nonwoven fabric.

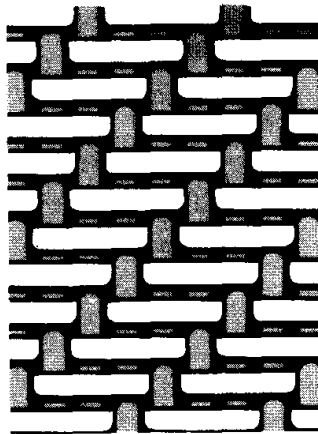
Understanding Fabrics

Quiz

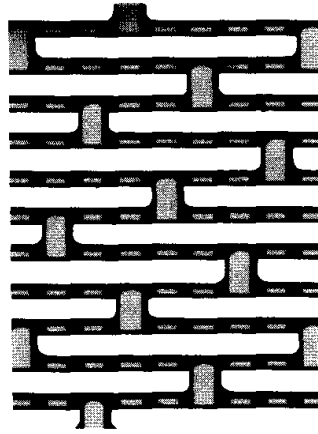
1. ____ Yarn is made of (a) fabric, (b) fibers, (c) threads, (d) cloth.
2. ____ Weaving, knitting, felting, and knotting are all means of making (a) fabric (b) fibers, (c) threads, (d) knits.
3. ____ Fabric can be made out of (a) pineapple leaves, (b) cotton, (c) synthetic fibers, (d) all of the above.
4. ____ Fibers are spun in order to (a) twist them into yarn, (b) create fabrics, (c) make yarn for knitting, (d) clean them.
5. ____ The difference between knitting and weaving is
 - (a) knits are handmade, weaves are machine loomed.
 - (b) knits are made of loops, weaves are of criss-crossed yarns.
 - (c) knits are made of tiny knots, weaves of a series of wave-like fibers.
 - (d) knits are stable, weaves are loosely structured.
6. ____ Satin, twill, and plain are (a) types of fabric, (b) types of fibers, (c) types of weaves, (d) types of knits.
7. ____ Thread count represents
 - (a) the number of threads woven into each square inch of fabric.
 - (b) an extra long staple.
 - (c) drying capacity.
 - (d) 100% cotton fabric.
8. ____ Dye is applied to fabric via (a) hot water, (b) steam, (c) dry heat, (d) all of the above.
9. ____ Which of the illustrations below shows a twill weave? (a),(b), (c), (d) none of them.
10. ____ Which of the illustrations below shows a satin weave? (a), (b), (c), (d) none of them.



A



B



C

Understanding Fabrics

Quiz Answer Key

1. B Yarn is made of (a) fabric, (b) fibers, (c) threads, (d) cloth.
2. A Weaving, knitting, felting, and knotting are all means of making (a) fabric (b) fibers, (c) threads, (d) knits.
3. D Fabric can be made out of (a) pineapple leaves, (b) cotton, (c) synthetic fibers, (d) all of the above.
4. A Fibers are spun in order to (a) twist them into yarn, (b) create fabrics, (c) make yarn for knitting, (d) clean them.
5. B The difference between knitting and weaving is
 - (a) knits are handmade, weaves are machine loomed.
 - (b) knits are made of loops, weaves are of criss-crossed yarns.
 - (c) knits are made of tiny knots, weaves are a series of wave-like fibers.
 - (d) knits are stable, weaves are loosely structured.
6. C Satin, twill, and plain are (a) types of fabric, (b) types of fibers, (c) types of weaves, (d) types of knits.
7. A Thread count represents
 - (a) the number of threads woven into each square inch of fabric.
 - (b) an extra long staple.
 - (c) drying capacity.
 - (d) 100% cotton fabric.
8. D Dye is applied to fabric via (a) hot water, (b) steam, (c) dry heat, (d) all of the above.
9. B Which of the illustrations below shows a twill weave? (a),(b), (c), (d) none of them
10. C Which of the illustrations below shows a satin weave? (a), (b), (c), (d) none of them.

Additional Information

Types of Fabric

Cotton

Invented: Used in ancient China, Egypt, India, Mexico and Peru

Made of: Cotton boll

Types of cotton fabrics and their uses:

Batiste originally was woven of cotton or linen and was sheer. It is named for the 18th-century French linen weaver Jean Baptiste. Today, the fabric may be made of fine wool, silk, polyester, or cotton blend fabrics, but is most commonly sheer, fine, mercerized cotton. It may be used for blouses dresses and lingerie.

Canvas is strong plain-woven cotton used as a home decorating fabric.

Chenille is a fur-like textured fabric made of cotton, silk, rayon, or wool. The warp threads are woven in groups. Created in France in the late 17th century, the fabric may be used as upholstery and clothing.

Corduroy may be derived from the French word *corde u roi*, “cloth of the king”. Corduroy is made of durable cotton or rayon velvet and has wide or narrow wales, cords, or ribs. First used as work clothes but now popular as casual dress.

Denim is a twill weave cotton fabric. It may also be cotton blended with rayon, polyester, or spandex. First worn as work wear, denim is popular as dresses, skirts, jackets, and trousers.

Eyelet fabrics have small cutouts with stitching around the edges of the cut. The fabric is used most often in children’s wear.

Flannel is generally 100% cotton but may also be made of wool. It may be a twill or plain weave. The face is brushed to create a soft, plush nap. It is often used for underwear, jackets, dresses, skirts, trousers, and pajamas.

Flannelette is soft cotton that is napped on one side. It is used to make underwear, nightwear, and children’s clothing.

Guatemalan Cotton is 100% cotton woven in Guatemalan ethnic designs. The fabric is used to make skirts, vests, jackets, tops, and home decorative items.

Jersey is a soft, stretchy knitted fabric of cotton, nylon, rayon, wool, or other synthetic fibers. It was first used on the Channel Island of Jersey in the late 19th century as sportswear.

Piqué is medium-weight cotton with a raised weave resembling a check.

Shirting is made from long staple cotton and is used to make tailored shirts, pajamas and boxer shorts.

Terrycloth is also called towelling. The cotton is woven with uncut loops on one side. It is typically used for towels but may also be used for beach wear or robes.

Voile is a fine, sheer plain weave fabric made of cotton, silk, wool or manufactured fibers. It is used to make blouses and dresses.

Linen

Invented: prehistoric

Made of: fiber of the flax plant

Uses:

- Household linens
- Apparel
- Wallpaper
- Upholstery
- Window treatments

Nylon

Invented: Dr. Wallace H. Carothers, a scientist at Du Pont, invented nylon in 1927.

Made of: As defined in The Thames and Hudson Dictionary of Fashion and Fashion Designers, Nylon is a "generic term for a manufactured fiber in which the fiber-forming substance is any long chain synthetic polyamide with recurring amide groups." Pg. 172

Types of nylon fabrics and their uses:

- Nylon is the third most used fiber in the United States.
- The most common use is in carpets.
- Nylon is frequently used to make lingerie, hosiery, socks, sportswear.

Tulle was originally made of silk and may have originated in Toul France. It is a fine fabric of hexagonal mesh. Tulle is often used dress and hat trimmings as well as bridal gowns.

Polyester

Invented: J. F. Winfield and J. T. Dickson of the Calico Printer's Association introduced polyester in 1941.

Made of: Ethylene glycol and terephthalic acid

Types of polyester fabrics and their uses:

Eyelash is lightweight polyester knit with a hairy face. It is used for sweaters, stoles, and scarves.

Faux Fur comes in two weights: a silky low-pile rayon or polyester, and stiffer, long-pile polyester. The fabric may be used to make capes or craft items.

Polyester Silky is as the name describes. It is suitable for blouses, dresses, and nightwear.

Rayon

Invented: It was patented in 1892 by the British chemists Cross, Bevan, and Beadle, but Kenneth Lord, Senior, actually named it in 1924. Lord had won a competition to name the artificial silk fabric.

Made from: Cellulose

Types of rayon fabrics and their uses:

Gabardine is a registered tradename and is a twill weave fabric made of rayon, cotton, or silk. Since the 19th century it has been used in suits, coats, dresses, and pants.

Rayon Viscose is produced from wood pulp and is the most common type of rayon made. It was patented in 1892 by the British chemists Cross, Bevan, and Beadle. This fabric is used to make full pants, full or A-line skirts, and dresses.

Suaded Rayon is brushed and has a silk-like hand. It is used to make full pants, skirts, and shorts as well as unstructured tops.

Silk

Invented: Silk originated in China. Confucius tells the story of Princess His-Ling, wife of Emperor Huang-Ti, in ca. 2700 B.C. sitting underneath a mulberry tree sipping tea. A silk worm cocoon fell in her cup. She played with the cocoon and discovered it unwound in a long thread. Thus began sericulture (the rearing of silkworms). However, evidence indicates silkworm breeding did not begin until several centuries later.

Made from: the cocoon of the silk worm

Types of silk fabrics and their uses:

Brocade is a figured silk fabric with gold or silver woven into it to create a raised design. It is often used in evening wear.

Charmeuse is the trade name of a 20th century satin weave fabric of silk, cotton, polyester, or rayon. It may be used for blouses, pants, lingerie or piping.

Chiffon is made of silk, rayon, or polyester. Silk chiffon has the best drape and is used to make full pants, loose tops, and flowing dresses.

China Silk is a plain weave silk. It is lightweight and suitable for garment linings.

Damask is a durable, lustrous, reversible figured fabric. It is commonly used to make tablecloths and napkins.

Georgette is silk or rayon similar to chiffon. It is used in eveningwear.

Pongee is a soft, thin Chinese or Indian silk and is generally a natural light brown color.

Satin is made of silk, polyester, or rayon. It is used for evening or special-occasion wear.

Silk Dupion is thick, crisp, and nubby (irregular). It is suitable for tailored pants, jackets, fitted dresses, straight skirts, or vests.

Silk Gazar is a crisp medium weight silk suitable for blouses and and loose evening coats. The fabric has a “gauzy” appearance.

Silk Noil is also referred to as raw silk. It is made of short waste fibers and is affordable. The fabric has a dull finish and ravel, but readily accepts dye. Silk Noil is used for unstructured clothing such as full pants and skirts, loose dresses, and big shirts.

Silk Organza may also be made of rayon and polyester, but organza made of silk is preferred for its superior handling. Silk organza is stiff, plain, thin and nearly transparent. Lightweight organza is used for interfacing and underlining of silk garments. Heavyweight silk organza may be used as a blouse. As with silk gazar, silk organza is best not used for garments requiring drape.

Silk, Sandwashed is brushed which softens the material and makes it more wrinkle resistant. This fabric is suitable for blouses, full pants, lingerie, and piping.

Silk Shantung is made from the silk wild silkworms. The fabric has a nubby (irregular) filling creating an uneven effect. It is a crisp fabric that has with a sheen. The fabric may be used for tailored pants and jackets, fitted dresses, straight skirts, or full special-occasion dresses.

Silk, Thai is similar to silk dupion, but is finer and less bulky. Thai silk is often used in evening, bridal, and period costuming. It may also be used as a home decorating fabric.

Silk Tussah is made from the cocoons of wild or semi-cultivated silkworms. The resulting fibers are coarse and uneven and when woven create a nubby appearance. The fabric is suitable for tailored pants, jackets and skirts as well as vests and other structured garments. Silk Tussah should not be used in garments that are meant to drape.

Silk Tweed is suitable for jackets and vests. This fabric snags easily.

Taffeta may be made of real silk or artificial silk. This fabric may have been named for the Persian fabric “taftan”. It has a glossy, iridescent sheen and rustles with movement. Taffeta is commonly used in special-occasion dresses.

Velvet was originally made from silk. The fabric is often used in evening or special-occasion clothing.

Wool

Invented: Wool is one of the oldest fabrics in the world.

Made of: Wool is made from the hair of sheep, goats, camels, and rabbits.

Types of wool fabrics and their uses:

Alpaca cloth was first introduced in 1836 by Sir Titus Salt as a silk and alpaca blend. In the late 19th century alpaca was blended with cotton. Today alpaca is available as a woven or knit and is commonly used for outerwear.

Angora is made from the hair of the Angora rabbit. It does not take dye well and is generally blended with another type of wool. Angora is used to make sweaters.

Boiled Wool is knitted wool that is felted, that is the knitted wool is machine-washed in hot water and machine-dried, usually more than once. Boiled wool may be used for jackets, cardigans, and mittens.

Camel Hair is made from the underhair of the camel. In the 19th century camel hair was a blend on cashmere and camel. Camel hair is primarily used for outer garments.

Cashmere is made of the hair of the kasmir goat found in Asia. This fiber has been used since the 14th century, but has been used extensively in Europe since the 19th century when it was used for children's clothing. In the present day, cashmere is used for coats, dresses, scarves, and sweaters. Cashmere may be blended with other fibers.

Lamb's Wool comes from animals younger than 7 months old. It is a fine soft fabric.

Mohair is made from the hair of the Angora goat. Mohair is loosely woven with cotton, silk, or wool and produces a fuzzy texture. Popularized in the 1950s, it is used for jackets, coats, skirts, and sweaters.

Wool Bouclé is a loosely woven or knitted fabric with small curls or loops on the face. Bouclé is from the French word *boucler*, meaning "to curl". This fabric has been popular since the 1950s and is used to make sweaters and coats.

Wool Challis is lightweight plain weave wool. It traditionally is printed with a floral pattern and is used for shirts and dresses.

Wool Crepe is the most common crepe, a woven fabric with a crinkled texture. Wool crepe is ideal for tailored pants, skirts, jackets, or dresses.

Wool Gauze is sheer and the least stable wool fabric. It is used to create loose tops, dresses and skirts.

Wool Jersey is a knitted fabric originating from the Channel Island of Jersey. It drapes well and is good for wrap and full tops, dresses, full pants and skirts.

Glossary

BLEND - A fabric made from two or more fibers blended together. For example, cotton and polyester in one fabric - sometimes called polycotton. A blend is not made of some threads of cotton and some of polyester; it is made of blended threads.

BROADLOOM - Type of loom use to make rolls of carpeting. Broadloom is not a fiber or fabric type nor does it imply high quality.

CALICO - One of the oldest known fabrics. Often made of complex designs and patterns. Today, calico has been replaced by percale, although the term is still used to refer to certain printed designs.

CANVAS - A plain, tight weave traditionally made of cotton.

CARDING - A process in which raw fibers (cotton, wool, etc.) are untangled and partially straightened by drawing them through a series of sharp points. After carding, fibers are combed.

CHAMBRAY - A plain weave fabric with a colored warp and a white filling of combed or carded fibers, traditionally cotton. Named after its birthplace - Cambrai, France.

CHENILLE - A velvet-like yarn traditionally made of cotton. Fibers protrude from the yarn, much like the tufts on the back of a caterpillar. The word "chenilid" is from the French word for caterpillar.

CHIFFON - A nearly transparent fabric made with a plain weave. Chiffon was originally made of silk, but today is often of rayon, silk, nylon and other synthetic fibers.

CHINO - A twill fabric with a slight sheen often of cotton or polycotton.

CHINTZ - A plain weave fabric, usually cotton often printed in bright colors. The fabric is often glazed to give a shiny surface.

COMBING - A process after carding in fibers are pulled into parallel alignment before spinning.

CORDUROY - A fabric named after the French phrase *cord du Roi*, "the cloth of kings." It is a ribbed, cut pile fabric in either a plain or twill weave. An extra set of filling yarns are used. After weaving the floats are cut on special machines to produce a "plowed field" effect. The raised ribs are called "Wales." A "wide wale" corduroy might have two or three wales per inch; a pinwale corduroy can have over 20 per inch.

CUT PILE - A fabric formed with loops on the surface. Cutting the loops produces a cut pile. Examples include corduroy, velvet, woven rugs, and traditionally made "plush" carpeting.

DENIM - A twill weave with blue warp threads and white filling threads. Denim is designed by the weight of a yard of fabric. A 14 ounce denim is heavy duty, while a 10 ounce denim is for summer wear.

DOUBLE KNIT - Double knits are the product of two sets of needles. The resulting knit has both sides identical and is stronger than a single knit. Double knit clothing often holds its shape better than single knit.

EGYPTIAN COTTON – Egyptian cotton, grown in the Nile Valley, is a long staple fiber famous for its lush feel. It is often blended with lower grade cottons, so look for 100% Egyptian cotton.

FABRIC - A general term referring to any material that is woven, knitted or somehow made into cloth.

FABRIC COUNT - see **THREAD COUNT**

FELT - A non-woven fabric made by pressing fibers together under heat to form a matted whole. Felted fabric is not strong but can easily be molded. Hats are often made of felt.

FILLING - The crosswise (weft) yarns in a fabric that interlace with the lengthwise (warp) yarns.

HAND The way fabric feels. It can be silky, soft, rough, etc.

FINISH - Various processes that change the fabric. Examples include treatments to make a fabric resist flames, repel water, shrink or wrinkle less, or shine more.

FLANNEL - A soft fabric usually made of cotton or wool. The surface is brushed to raise fibers that create insulating air cells. Flannel is soft and warm.

GABARDINE - A tightly woven twill that produces a very durable fabric. Wool is the primary fiber used for gabardine.

HERRINGBONE - A twill weave in a 'V' pattern, most often in wool. Also called a broken twill.

INTERLOCK KNIT - A very firm knit made of two interlocked rib knits. Both sides of the fabric look like the face side of jersey.

JERSEY KNIT - A generic term for a fabric made of a plain knit stitch without the distinct ribs found in many knitted textiles.

KNIT - A way of making fabrics by interlocking loops of one or more yarns.

LOOM - Machine used to weave yarn into fabrics.

MUSLIN - An inexpensive, plainly woven fabric, originally made of cotton. Today the word is used for almost any plain fabric.

NAP - A fuzzy surface on fabric usually produced by brushing. Fiber ends are teased out of loosely spun yarns and brushed so they stand up on the surface of the fabric.

OXFORD - A plain weave often used in shirts. Traditionally of cotton or a cotton blend and often with a colored warp and a white filling. The lighter weights are sometimes called Cambridge, after Oxford's rival university.

PERCALE - A plain weave cotton (or cotton blend) fabric often used for linens. Percale has a thread count of 180 to 350 yarns per inch. Percale comes in a wide variety of colors and prints.

PILE - Pile fabrics feature short lengths of yarn stand up from the base of the material much like blades of grass in a lawn. Pile is by woven loops. Uncut loops give a "looped pile" fabric such as terry cloth. Cut loops give a plush or velvet fabric.

POPLIN - A family of plain weave fabrics characterized by crosswise ribs. The ribs are created by warp yarns that are finer than the weft yarns. Poplin is made of many fibers and in a variety of weights and qualities.

PLAIN WEAVE - The most used basic weave. Each filling yarn alternates crossing over and under each warp yarn. Like a window screen or tennis racket.

PRINT - A fabric on which a design or color is printed rather than woven or knitted.

REPELLENCY - A fabric's ability to resist water, stains, soils, etc. It does not mean that no water will get into the garment. Water-resistant fabrics, in contrast, are engineered to keep the wearer dry in rain, snow, etc. for a specified length of time.

SATIN - A weave in which each yarn crosses over four to twelve other yarns before going under another. The distance the yarn covers is called a "float." Because of these long "floats" the satin weave is flat, smooth, and lustrous. Usually made of silk or man-made fibers that give a lustrous, shiny appearance.

SEERSUCKER - A fabric named from the Persian word "shirushaka," meaning blistered. It's a plain weave created by holding some warp yarns at a tight tension, others with some slack. The difference in tension causes the wave-like blisters that give the fabric its distinctive texture.

SELVAGE - The woven edge of the fabric, running parallel to the warp. The selvage keeps the textile from fraying. It is often used to identify the manufacturer or provide a color check.

SERGE - A twill weave from smooth yarns. Traditionally, a long lasting fabric of wool for men's suits.

SPINNING - The process of twisting short lengths of fiber (called staples) fibers into continuous yarn.

TAFFETA - Fabric woven from tightly twisted yarn. Filling yarns are slightly larger than the warp yarns, creating a cross ribbed effect. Taffeta is often a shiny fabric with a crisp, smooth feel.

TERRY CLOTH - A fabric usually made of cotton with uncut loops. The looping adds yarn making the material higher absorbent and excellent for towels and bath robes.

THREAD COUNT - The thread (or fabric) count measures the number of yarns per square inch. More yarns per inch gives strength, and durability - and higher cost. A count of 80 x 60 means that in one square inch of fabric there are 80 yarns in the warp and 60 in the weft. If the two numbers are the same, the fabric is a balanced or "square" weave and the count can be given as one number, the sum of the warp and weft counts. So a percale fabric with a thread count of 180 means that in each square inch the fabric has 90 warp yarns and 90 weft yarns.

TWEED - A nubby, woven fabric often used in suits. Traditionally made of wool or wool blends.

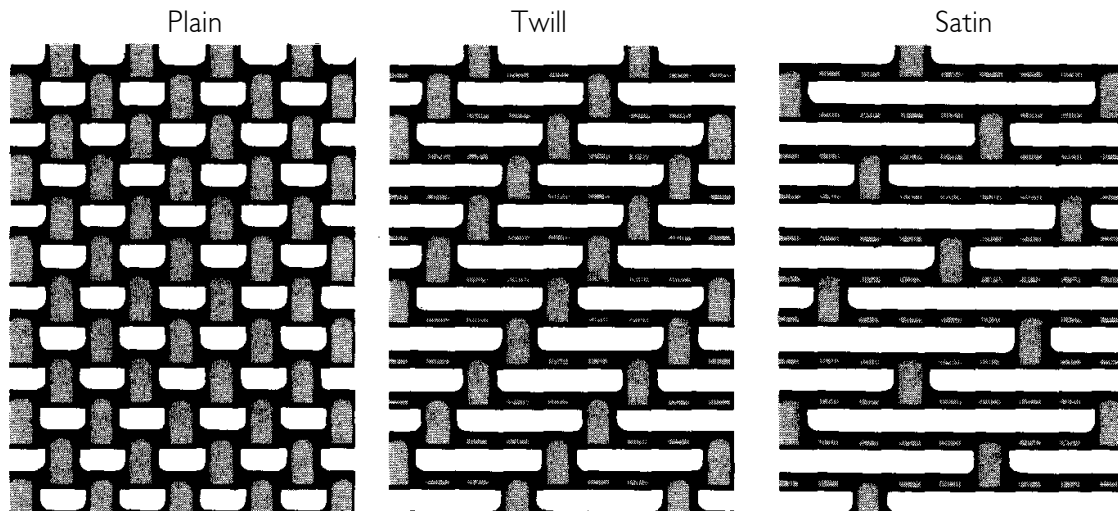
TWILL WEAVE - One of three basic weaves. Recognized by the diagonal "twill line" or "rib" visible in the finished fabric.

WARP - In weaving, the yarns placed on the loom first. They run lengthwise on the fabric. Weft or filling yarns are woven over and under the warp yarns.

WATERPROOF- typically suggests a protective laminate such as Urethane or another micro-porous film has been applied. Manufacturers of waterproof garments usually take additional measures such as seam-sealing to ensure that water cannot seep through any opening in the garment.

WEFT - The crosswise filling yarns that are interwoven with the lengthwise warp yarns to make a fabric.

WEAVING - A method of making fabrics by interlacing yarns at right angles. The three basic weaves are plain, twill and satin. Each is illustrated below:



WICKING - Diffuses moisture, pulling it through to the surface of a fabric away from the skin; this keeps the wearer dry.

WORSTED - Worsted wool fabrics are woven from yarn that has been carded and combed before spinning. Longer fibers are used for worsteds than for regular woolen fabrics. Common worsteds include gabardine and serges. Worsteds are smoother and more tightly woven than woolens.

YARN - Long, continuous threads created by spinning fibers. Spinning adds a twist to the fibers for strength.

For More Information...

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