HEAD HEART HANDS HEALTH

4-H Textile Experiments

CLOTHING CONSTRUCTION SUPPLEMENT

COLORADO STATE UNIVERSITY
EXTENSION

Acknowledgements

This manual adapted in August, 2003, by the State 4-H Clothing Curriculum Development Committee from the original 4-H Textile Experiments written by Jane Hill, Certified Home Economist and volunteer leader and Judy Meier, Colorado State University Cooperative Extension agent, from Boulder County.

Members of the 2003 Clothing Curriculum Development Committee included: Lulu Marie Hatheway, Adams County; Jane Hill, Boulder County; Sharon Blackham, Yuma County; Julia Hurdelbrink and Louise Welsby, Colorado State University Extension 4-H agents from Adams and Pueblo Counties respectfully; Jan Nixon, director, Logan County Extension, Colorado State University; and Sue Cummings, Extension Specialist, 4-H Youth Development, Colorado State University.

The 4-H Textile Experiments supplement was reviewed and revised in 2024 by:
Kim, Eastwood, 4-H Youth Development Specialist, Weld County, Colorado State University Extension
Lisa Sholten, 4-H Youth Development Specialist, Civic Engagement and Curriculum, State 4-H Office, Colorado State University Extension.

Table of Contents

Information Page:

Your Name: _____ 4-H Age: _____

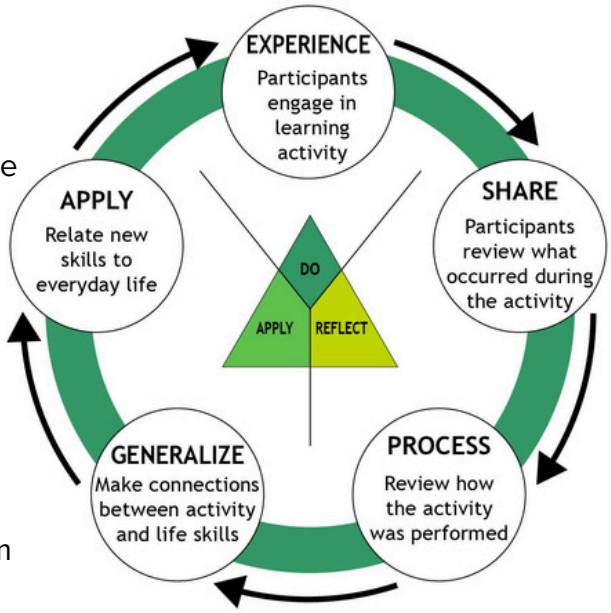
County: _____

Club Name: _____

Guardian's Signature: _____

Leader's Signature: _____

Experiential Learning Process



The 4-H program utilizes a process where adult leaders ask open-ended questions that challenge youth to think. Through this inquiry, youth can propose hypotheses and determine their own solutions. The Experiential Learning Model developed by Pfieffer and Jones (1985) and modified by 4-H includes five specific steps that can be summarized into three main processes: Do, Reflect, and Apply.

The Experiential Learning Model encourages discovery with minimal guidance from others. A situation, project or activity is undertaken for individual thought and problem solving. Minimum outside assistance is provided, but support is offered to the individual by questioning at each stage. The youth participating in an activity reflect on what they did and then assess how what they learned can be applied to a life situation. Below are questions that might help during each stage of learning.

1) Experience (Doing)
Questions: What sources of information are available? What is possible? What do you expect to see? How is it working? What else might you try?

2) Share (Reflecting on what occurred)
Questions: What was your goal for this project/activity when you began? What happened? What were the results? What was most difficult? How do you know? What did you learn? What surprised you? How did you share this project/activity with others?

3) Process (Reflecting on what's important)
Questions: What problems seemed to reoccur? How did you solve them? What similar experiences have you had? How was the experience like or unlike experiences others had? Would you do anything differently? What did you learn about making decisions? What suggestions would you have for someone else who wanted to do a similar project/activity? What life skills were you developing through your project? Why are life skills important? What new questions do you have about yourself, others, and future goals?

4) Generalize (So what?)
Questions: What did you learn about yourself or about the activity? What key points have you learned? How did you decide what to do? What else could you have done? How does this relate to something else in life? Where have you faced similar challenges in your life? Where might this situation occur in the future? Why is it important to have plenty of information before making decisions? What did you learn about your own skill in communicating with others?

5) Apply (Now what?)
Questions: How does this project/activity relate to your everyday life? Why is this project/activity important to you? Where else can this skill be used? How will you use this in the future? What will you do differently after this experience? How can I make an impact? What will I create next? In what ways do people help each other learn new things? What are qualities you think are important in a leader? If someone helped or mentored you in this project, what would you tell them you learned and what difference it has made in your life? How would you express your appreciation?

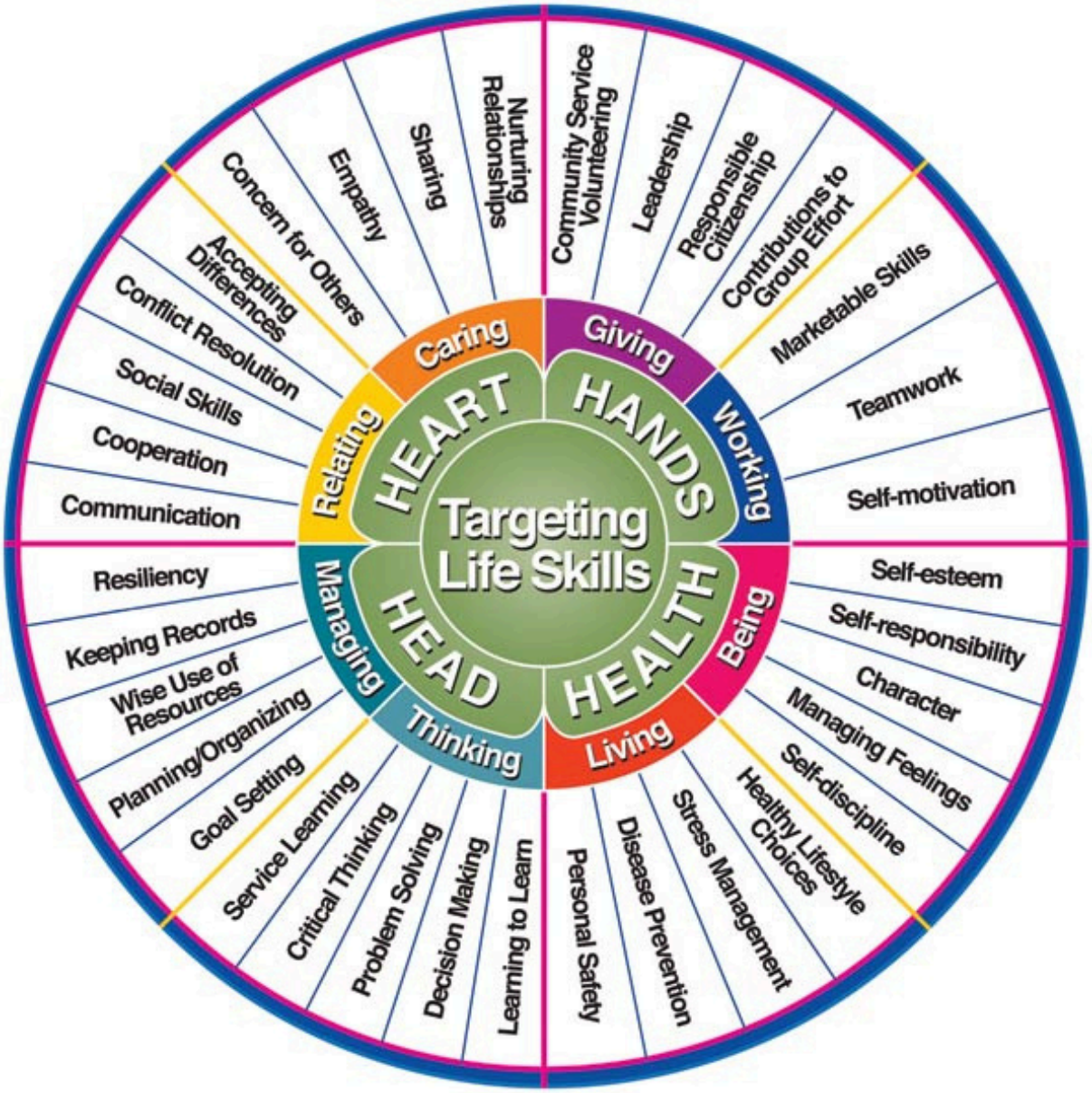


Image: Hendricks, P. (1998) "Developing Youth Curriculum Using the Targeting Life Skills Model" http://www.extension.iastate.edu/4H/skls.eval.htm

Targeting Life Skills

A skill is a learned ability. Life skills are those abilities that assist individuals to lead successful, productive, and satisfying lives. In 4-H, we use the Targeting Life Skills Model to help youth become competent and prepared for adulthood. The Targeting Life Skills Model categories are based on the four H's from the 4-H clover (Head, Heart, Hands, and Health). Under each of these main categories, there are four categories and eight subcategories listing specific skills youth learn in 4-H. The main goal in 4-H positive youth development is to provide developmentally appropriate opportunities for youth to experience life skills and to be able to use them throughout a lifetime. By understanding the importance of the 4-H framework and its structure, 4-H members, parents, professionals, and leaders will know the expectations and will be able to effectively use 4-H delivery methods to help youth learn these life skills.

About the 4-H Thriving Model

The 4-H Program Leaders' Working Group developed the 4-H Thriving Model to advance and support the accomplishment of the 4-H Youth Development 2025 National Strategic Plan. They describe the 4-H Thriving Model as follows:

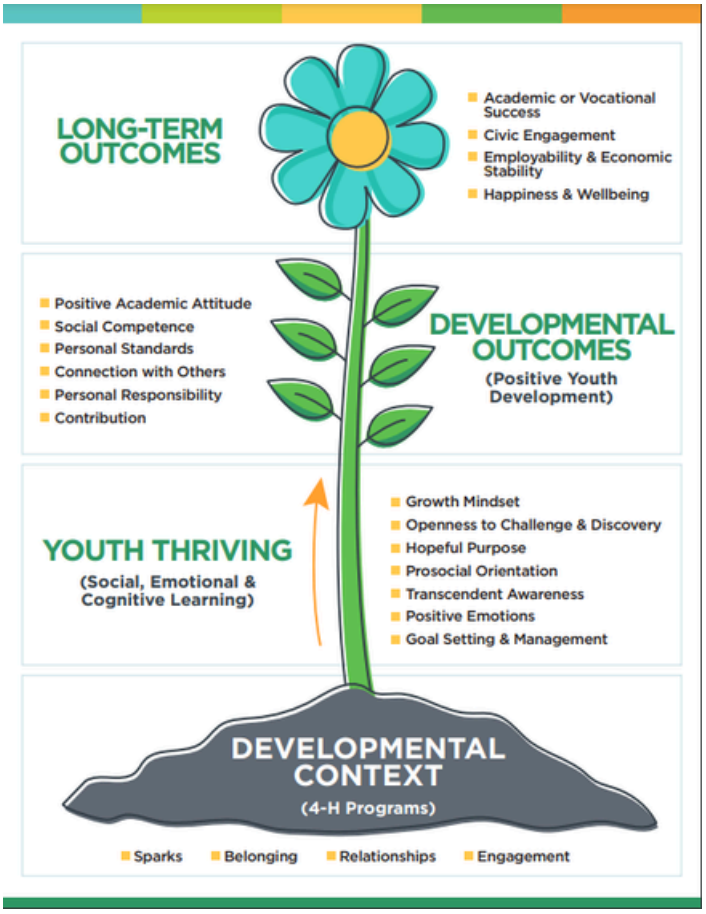
The 4-H Thriving Model illustrates the process of positive youth development in 4-H programs by connecting high quality program settings to the promotion of youth thriving.

High quality 4-H program settings provide youth a place to belong, matter and explore their personal spark. High quality settings foster developmental relationships with youth, relationships that express care, challenge growth, and share power. These components help ensure that 4-H programs provide a nourishing developmental context – a place where youth can belong and grow.

High quality 4-H programs contribute to Positive Youth Development (PYD) through the intentional promotion of social, emotional, cognitive, and behavioral habits of mind. In the 4-H Thriving Model this process of PYD is described by seven indicators of thriving: Openness to challenge and discovery, growth mindset, hopeful purpose, pro-social orientation, transcendent awareness, positive emotionality, and self-regulation through goal setting and management.

Youth who experience high quality developmental settings in 4-H with an emphasis on these key social-emotional skills achieve key positive youth development outcomes including academic motivation and success, social competence, high personal standards, connection with others, personal responsibility, and contribution to others through leadership and civic engagement.

Youth who achieve positive developmental outcomes are more likely to also achieve long-term outcomes marked by vocational or academic success, civic engagement, employability, economic stability, happiness, and well-being. (Learn more at https://helping-youth-thrive.extension.org/.)



Introduction

Congratulations! You are about to begin a series of fun experiments designed to help you learn more about fabrics. The textile experiments in this manual are quick, easy exercises that will help you think about how your garment fashion fabric reacts in every day situations.

Before you begin, be sure and read over all the experiments and select the one that interests you the most. Remember that the textile experiment you select could also serve as the basis for a school science fair project!

You need to think about the experiment you chose and collect an adequate amount of samples from your garment fashion fabric and if required, other fabrics. It will be easier and quicker to collect samples at one time. It is not necessary to purchase more fabric for this experiment.

Project Guidelines

Complete one experiment using your garment fashion fabric each year.

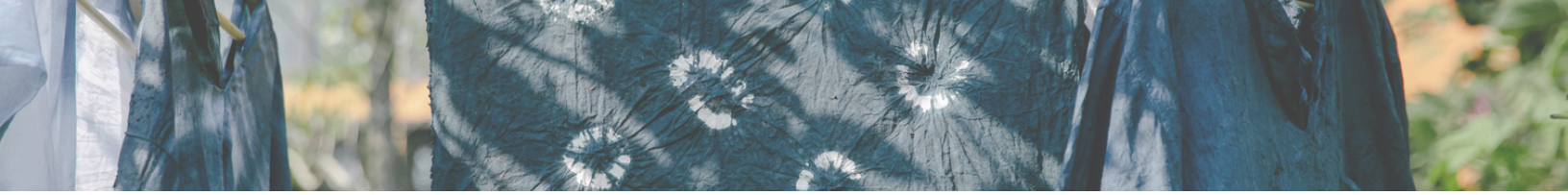
1. Experiments may be repeated in a subsequent year as long as you use different fabrics.
2. Include the completed experiment sheets from this booklet with your 4-H Clothing e-Record.
3. Mount fabric samples on 8 1/2" x 11" heavy paper and include with your record book.
4. No photos of experiments are allowed.

Your answers will vary depending on the fabric you select, and be sure to record all results. There are no right or wrong answers.

Additional Help

Some additional resources you might use are the STEAM Clothing 3: A Stitch Further manual, commercial sewing or textile books from the library, the Colorado State University Extension county coordinator/specialist, or local teachers.

Good luck and have fun!



Introduction to Textile Experiments

Experimentation is a process of learning how things work and why they happen. It may challenge individuals to become curious about the answers and do further investigations. Some facts are listed below that may provide answers to the experiments that follow. These experiments are only a beginning step. Ask yourself what other experiments can be tried.

- There are four major natural fibers and 23 man-made fibers currently available for use in garments or household items.
- The weight and weave of the fabric will affect how easily the material will ignite and burn.*
- Too hot of water and dryer temperatures can set fabric wrinkles in some fabrics that are difficult or impossible to remove.
- Some fabrics will dissolve when exposed to undiluted liquid chlorine bleach.
- Chlorine and nonchlorine bleaches brighten, whiten and enhance color.
- Extremely soft water combined with calcium and magnesium ions can cause soap build up in clothing.*
- Some fabrics will shrink when exposed to high water, dryer or iron temperatures.
- Heat sensitivity is a property of fibers that results in shrinking, softening or melting when heat is applied.
- White vinegar can be used to set or remove permanent creases in fabric.
- Fabrics may separate, pill or wear more quickly due to exposure to abrasion.
- Fresh stains are much easier to remove than old ones, so take care of stains promptly.
- Various fabrics react differently to lengthy exposure to the sun.*
- Textiles are used for personal hygiene products, food retail, sports and recreation, transportation, animal care, agriculture, medical, protective gear and building materials. Each use requires different fabric characteristics.*

NOTE: An asterisk (*) indicates suggestions for "Design Your Own" Experiments. See Experiment # 14.

Experiment #1 - Burn Test

CAUTION: DO THIS IN THE KITCHEN WITH AN ADULT! 

Materials

1. 2" squares of the following fabrics:
   a. 100% wool fabric
   b. 100% cotton fabric
   c. 100% polyester fabric
   d. Your garment fashion fabric
2. Tweezers, pliers or tongs to hold fabric tightly
3. Matches, lighter or candle
4. Bowl of water for safety
5. Four 4" X 4" (minimum) pieces of aluminum foil
6. Pen/marker

Procedure

1. Label samples and foil with fiber content of each sample.
2. Pull out three to five fibers from each sample and place on labeled foil.
3. Hold first sample with tweezers over foil.
4. Light with match, lighter or candle.
5. Observe flame, ash, residue and burning characteristics (smell).
6. Record your observations.
7. Repeat with other samples.
8. Record your observations.

Observations

Sample	Burn or Melt	Shrinks from Flame (Yes or No)	Odor	Describe Ash or Residue
Wool Fabric				
Cotton Fabric				
Polyester Fabric				
Fashion Fabric				

Experiment #1 - Burn Test

Conclusions

- Why is it important to do a burn test on fabrics?

- Why do you think polyester reacted the way it did? How does this present a safety concern? Did your fabric react differently? Did the natural and synthetic fibers burn the same or differently?

- Why do firemen recommend wool blankets? Which fibers would you use to smother a fire? Which fibers would you use if making a garment for a toddler?

- What implications does the burn test have when wearing garments made using fabrics that contain these fibers?

Experiment #2 - Crush Test

Materials

1. 3" - 8" square fabric samples that include:
    a. A woven 100% cotton fabric
    b. A knit fabric such as from an old T-shirt
    c. Your garment fashion fabric

Procedure

1. Label samples and record below with fabric names.
2. Wad up a sample in your fist, hold for IO seconds and release.
3. Observe immediately and two minutes later.
4. Record what you observed.
5. Repeat with remaining samples and record observations.

Observations

Sample	Immediate Results	Change After 2 Minutes
Woven Cotton		
Knit		
Garment Fashion Fabric		

Experiment #2 - Crush Test

Conclusions

- Explain why it is important to do this test on fabrics.

- Did the knit differ from the woven fabric in this test? How might the results you observed impact wearability of a garment made from these fabrics?

- What other factors, other than design, might influence the appearance and wearability of a garment?

Experiment #3 - Bleach Test

CAUTION: DO THIS IN THE KITCHEN WITH AN ADULT! 

Materials

1. Liquid chlorine bleach
2. Liquid non-chlorine bleach
3. Fabric samples, two 2" squares each of:
   a. 100% Wool
   b. I00% Cotton
   c. I00% synthetic
   d. Project fashion fabric
4. Two plastic straws or eyedroppers (use one for each bleach)
5. Two glass or ceramic bowls (to hold straws/eyedroppers between samples)
6. Aluminum foil (approximately 12" in length)

Procedure

1. Label each sample and place on aluminum foil.
2. Insert straw into liquid chlorine bleach. Place finger over end of straw to suspend bleach in the straw. Do not place straw in your mouth! Place one to two drops of liquid chlorine bleach on one 2" square of each fabric.
3. Record results immediately and after I5 minutes.
4. Repeat steps 2 and 3 using non-chlorine bleach.
5. Carefully discard foil and remaining liquids.
6. Allow samples to dry, mount on heavy paper and label. Include in your record book.

Observations

	Chlorine Bleach		Non-Chlorine Bleach	
Sample	Immediate Results	After 15 Minutes	Immediate Results	After 15 Minutes
Wool Fabric				
Cotton Fabric				
Synthetic Fabric				
Fashion Fabric				

Experiment #3 - Bleach Test

Conclusions

- Which fibers were most affected by the chlorine bleach? On which fabrics would chlorine bleach be inappropriate?

- Which fibers were affected by the non-chlorine bleach?

- How can bleach help in fabric care?

- Why is it important to read manufacturer's instructions on laundry aids? On care labels?

Additional questions to think about:
How can overuse of chlorine bleach be used to create a fashion effect, i.e., tie dying, reverse dyeing, or stone wash?

Will a change in the concentration of bleach used vary the outcome of this experiment?

What are some health considerations related to bleach use?

Experiment #4 - Shrink Test

Materials

1. At least 8" squares of new, unwashed fabric cut on grain
    a. 100% wool - two squares (do not use washable wool for this experiment)
    b. 100 % cotton - two squares
    c. Project fashion fabric - two squares
2. Hot water (at least 100 °F temperature) - sink (use a spoon to agitate to prevent skin burns)
3. Clothes or hairdryer
4. Ruler
5. Towel

Procedure

1. Cut squares of fabrics, measure carefully, label and record below.
2. Soak and agitate all squares in hot water for at least 5 minutes.
3. Remove fabric from water and blot out excess. Do not wring.
4. Allow one square of each fabric to dry flat. Measure when dry and record below.
5. Dry one square of each fabric in a clothes dryer or with a hairdryer, set on high.
6. Measure and record.

Observations

Sample	Original Size	Size After Air Dry	Size After Machine Dry
Wool			
Cotton			
Garment Fashion Fabric			

Experiment #4 - Shrink Test

Conclusions

- Which fabric changed size the most? How might that result affect your use and care of this fabric?

- How might the results differ if you agitated fabric in cold water? Line dried? Used a cool dryer temperature?

- Why is it important to read care labels on garments or fabric bolts?

Additional question to think about:
How would this experiment differ if you use washable wool?

Experiment #5 - Fabric Softener and Static Electricity Test

Materials

1. A variety of five washable garments; include some with synthetic fabrics (for example, dress socks, synthetic underwear or blouse)

OR

1. 8" squares of at least five different fabrics; include synthetics and garment fashion fabric
2. Washer and dryer
3. Fabric softener: liquid or dry sheets
4. Detergent without fabric softener

Procedure

1. Use all garments or fabrics, wash and dry them without fabric softener.
2. Remove from dryer. Carefully observe evidence of static electricity (i.e. garments cling to each other), softness and wrinkles.
3. Record your observations below.
4. Wash and dry garments or fabrics. Use fabric softener as directed by manufacturer.
5. Repeat steps 2 and 3.

Observations

Type of Fabric or Garment	Without Softener			With Softener		
	Static Electricity	Softness	Wrinkles	Static Electricity	Softness	Wrinkles
A.						
B.						
C.						
D.						
E.						

Experiment #5 - Fabric Softener and Static Electricity Test

Conclusions

- Why do we use fabric softener?

- On what fabrics do you think fabric softener works best?

- How do you feel when you wear garments that have not been treated with fabric softener? Explain.

Additional questions to think about:
What might be the effect if double or triple strength fabric softener was used? (Note: Do not use garments for this experiment.)

How would the results of this test differ on a rainy/humid day? Why?

What other variables affect the outcome of this test?

What are some of the health considerations related to use of softener products?

Experiment #6 - Acetone Test

CAUTION: DO THIS IN THE KITCHEN WITH AN ADULT! 

Materials

1. 2" X 2" squares of each:
    a. One acetate fabric
    b. One non-acetate fabric, e.g., 100% Cotton (may include project fashion fabric if not an acetate/acetate blend)
    a. One acetate blend fabric
2. Eye dropper or plastic straw
3. Acetone nail polish remover (check label for acetone base)
4. Glass custard cup
5. Glass rod or wooden stick (chop stick or toothpick)
6. Paper towels

Procedure

1. Label your samples - l, 2 and 3.
2. Test warp and filling threads.
    a. Remove some warp threads and some filling threads from sample # l . Keep warp and filling threads separate.
    b. Place warp yarns in glass dish.
    c. Place l or 2 drops of acetone on the yarns.
    d. Rub stirring rod (toothpick) across dampened parts.
    e. Record observations. IF THREADS DISSOLVE READILY, THE FIBERS ARE ACETATE.
    f. Repeat steps b - e for filling threads.
    g. Repeat steps a - f for fabric sample # 2.
3. Test comers of samples# 2 and # 3.
    a. Place corner of sample #2 in dish.
    b. Place 1 or 2 drops of acetone on the corner.
    c. Record observations.
    d. Clean off the glass dish with a paper towel immediately after each test to prevent hardening of the solution.
    e. Repeat steps a - d for fabric # 3.

NOTE: If there is a small amount of acetate in the fabric, no change may be noticed until the fabric dries. Then, a definite stiffening can be felt.

Experiment #6 - Acetone Test

Observations

Sample	Visual Changes	Changes in Hand (how fabric feels)
Warp #1 100% acetate		
Filling #1 100% acetate		
Warp #2 non-acetate		
Filling #2 non-acetate		
Corner #2 non-acetate		
Corner #3 acetate blend		

Conclusions

- Acetate thread is made from a chemical liquid solution. Use this information to explain the changes you observed in fabric #1 when dampened with acetone.

- When would this type of test be helpful to you?

Experiment #7 - Permanently Set Creases with White Vinegar

CAUTION: DO THIS IN THE KITCHEN WITH AN ADULT! 

Materials

1. Three washable fabric samples of different fibers at least 8" X 8" (You may use new or old fabric or old garments.)
2. Plain white vinegar
3. Bowl
4. Straw or eyedropper
5. Steam iron

Procedure

1. Label samples A, B, and C.
2. Pour about 1/4 cup of white vinegar into a small bowl.
3. Press a crease lengthwise through each sample with a steam iron.
4. Wet ½ of the crease with vinegar by using your finger on the straw or an eye dropper.
5. Press this ½ of the crease with the iron.
6. Launder all samples according to care instructions.
7. Record your observations.

Observations

Describe your sample.	Describe the pressed crease after washing.	Describe the crease pressed with vinegar after washing.
A.		
B.		
C.		

Experiment #7 - Permanently Set Creases with White Vinegar

Conclusions

- What was the effect of using vinegar to set in creases?

- Were any of the fabrics damaged by this experiment? If yes, explain how.

- Even if none of the fabrics were damaged, do you think vinegar might be hazardous to use on some fabrics? Why or why not?

- How might vinegar help prepare fabric before pattern layout?

Experiment #8 - Abrasion Test

Materials

1. Four 8" square fabric samples
    a. Woven denim
    b. Any silky, thin knit fabric
    c. A rough-textured woven or knit fabric
    d. Your project fashion fabric (different from A, B, or C)
2. Sand paper - medium to fine grade

Procedure

1. Label each sample.
2. Scratch (abrade) the surface of each fabric 20 times with the sand paper.
3. Observe changes in each fabric. Record.
4. Repeat step 2 using new sandpaper. Record appearances after 40 strokes.

Observations

Describe Your Sample	Changes in Fabric After 20 Strokes	Changes in Fabric After 40 Strokes
A.		
B.		
C.		
D.		

Experiment #8 - Abrasion Test

Conclusions

- What characteristics of the sample fabrics made them susceptible or resistant to abrasion? Explain.

- How do the results of this test help in fabric selection?

- Why would it be important to consider intended garment use when purchasing a ready-made garment?

Experiment #9 - Heat Test

CAUTION: DO THIS IN THE KITCHEN WITH AN ADULT! 

Get permission to use an iron because the experiment may leave fiber residues on the iron's sole plate. Check to see if an old iron is available to use for this experiment.

Materials

1. Three fabric samples at least 8" X 8"such as synthetic, cotton-polyester blend, woo or rayon and project fashion fabric
2. Iron
3. Pressing cloth
4. Water and spray bottle or wet cloth

Procedure

1. Label each sample and identify below with fiber names.
2. Set iron temperature to HIGH.
3. Using one piece of each type fiber or fiber blend, press (don't move iron) for 15 seconds in one area.
4. Record observations.
5. Check sole plate of iron for residue. To clean iron sole plate use a commercial iron sole plate cleaner or rub iron in table salt sprinkled onto a paper grocery sack. Wipe off.
6. Repeat in new area and using a pressing cloth with no moisture. Record observations.
7. Repeat in new area and use a pressing cloth with some moisture. Record observations.
8. Repeat steps 1 through 6 for other fibers chosen.

Observations

Sample	Dry Iron	Pressing Cloth	Moisture and Pressing Cloth
A.			
B.			
C.			

Experiment #9 - Heat Test

Conclusions

- Which fabric was the most heat sensitive?

- Why do we sometimes use a pressing cloth?

- Which natural fiber(s) require(s) a low setting on the iron? A high setting?

- How would you ensure that the iron temperature is safe for your project fashion fabric?

- If the iron is too hot, the fibers will soften enough to be flattened by the pressure of the iron or they will melt. Flattening the surface is called glazing. A glazed surface will look shiny. Did you find glazing results on any fibers tested? Which ones?

Experiment #10 - Effects of Marking Tools

Materials

1. Firmly woven 100% cotton fabric
2. 100% polyester fabric
3. Your project fashion fabric
4. Three or more marking tools (i.e. pencils, chalk, paper, etc.)
5. Instructions for use of marking tools, if available
6. One eraser or dry cloth
7. One damp cloth
8. Steam iron

Procedure

1. Cut five pieces from each fabric, 3" X 3" on grain, number 1 - 5
2. On all samples, mark a line with each tool chosen (i.e. three tools will be three lines)
3. Record your observations based upon the follow:
    a. Sample 1 - brush with the eraser or a dry cloth after IO minutes.
    b. Sample 2 - rub lightly with a damp cloth after 10 minutes.
    c. Sample 3 - press with a steam iron after 10 minutes.
    d. Sample 4 - machine wash, tumble dry and press.
    e. Sample 5 - let sit and record after 24 hours.

Experiment #10 - Effects of Marking Tools

Observations

Fabric	Tool Used	Sample #1	Sample #2	Sample #3	Sample #4	Sample #5
Cotton						
Polyester						
Fashion Fabric						

Experiment #10 - Effects of Marking Tools

Conclusions

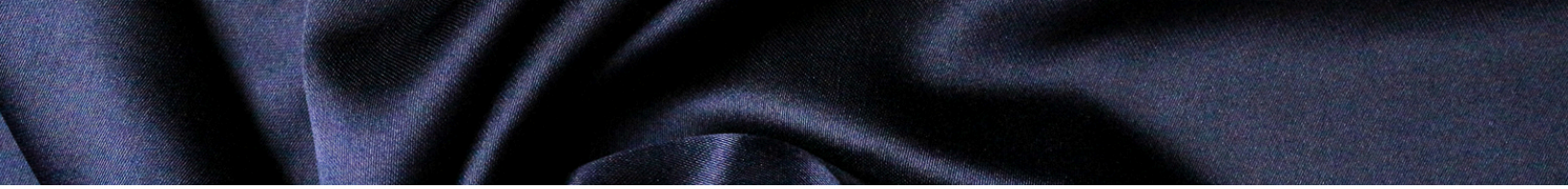
- Did the marking tools react as the instructions stated?

- Which ones reacted differently than expected and under what circumstances?

- What cautions should be taken when using marking tools?

- Why do instructions caution the user to "test the marking tool on the fabric first?"

- What other methods may be used to mark fabrics?



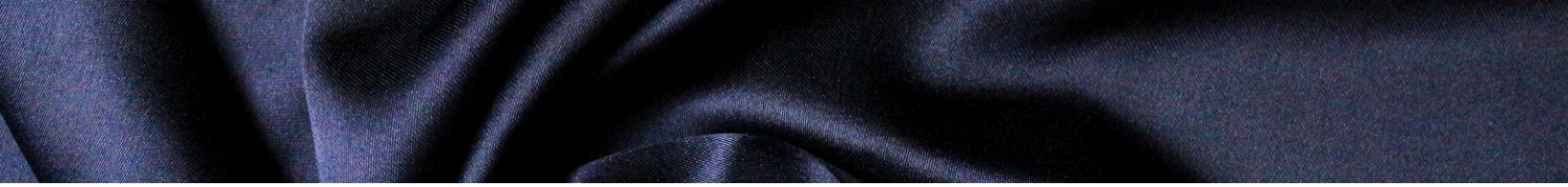
Experiment #11 - Bias Stretch

Materials

1. Samples from a variety of fabrics and weaves, including a sample from your garment fashion fabric (10 maximum)
2. One sheet of white card stock
3. Ruler

Procedure

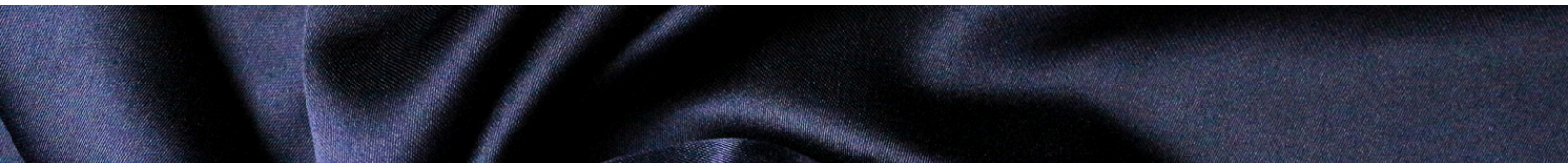
1. Cut one sample 1" X 2" on true bias for each fabric and weave sample.
2. Draw two straight lines the length of the paper, 2" apart.
3. Staple one end at the left side of the card stock, pull the other end of the sample until distortion* begins to be seen. (*Distortion is when the weave begins to come apart, or when a seam would not hold.) This is an approximate guess on your part.
4. Have another person mark how far the sample stretched.
5. Let the sample relax.
6. Identify fabric and weave, if possible.
7. Record observations.
8. Repeat steps 1 through 7 for each remaining fabric sample.



Experiment #11 - Bias Stretch

Observations

Fabric	Sample Weave	Inches of Stretch	Condition of Related Sample



Experiment #11 - Bias Stretch

Conclusions

- Which fabric/weave stretched the most without distortion? What do you think might be the reason?

- Which fabric/weave stretched the least? What do you think might be the reason?

- Give some examples of when bias is used in sewing.

- When would bias stretch be advantageous?

- When would bias stretch become a problem?

- How could you prevent the bias from stretching?

- If a fabric has more stretch in a bias, would the garment be:
  - More comfortable?
  - Easier to care for?
  - Last longer?

Experiment #12 - Durability of Mending a Tear Methods

Materials

1. Three 6" squares of garment fashion fabric
2. One small piece of the fabric 1" X 1"
3. Matching thread
4. Iron-on interfacing
5. Fabric glue
6. Iron-on mending tape
7. Scissors
8. Sewing machine
9. Hand sewing needles
10. Iron

Procedure

1. Finish the edge of the sample piece.
2. Make eight small l" cuts in various places on the fabric with the scissors.
3. Mend each cut using the following:
    a. by hand sewing the edges together.
    b. by using iron-on mending tape.
    c. by using iron-on interfacing (two layers).
    d. attaching self-fabric on back, zig-zag on front
    e. attaching interfacing on back, zig-zag on front.
    f. by using fabric glue.
    g. zig-zag only.
    h. leave one cut un-mended.
4. Wash and dry the fabric piece with the family laundry, three separate times.
5. Observe the results after each dryer cycle before proceeding onto the next wash.
6. Mount your sample.

Experiment #12 - Durability of Mending a Tear Methods

Observations

Method	#1 Wash and Dry	#2 Wash and Dry	#3 Wash and Dry
Hand Sewn			
Iron-on Mending Tape			
Iron-on Interfacing			
Self-fabric/Zig-zag			
Interfacing/Zig-zag			
Interfacing/Fabric Glue			
Fabric Glue Only			
Zig-zag only			
Unmended			

Experiment #12 - Durability of Mending a Tear Methods

Conclusions

- Which method or methods of mending had the most durability after three washings?

- Which method or methods look best to you?

- Which mending method would be best for a tear located on the:
  - front of a shirt?
  - underside of a sleeve?
  - top side of a collar?
  - along the hem of a garment?

- When would it be important to have a durable, attractive mend on a cut in a garment?

Experiment #13 - Stain Removal

Materials

1. Five 4" X 4" samples of garment fashion fabric
2. Ketchup
3. Crayons
4. Ink pen
5. Mustard
6. Grape or cranberry juice
7. White vinegar
8. Water
9. Commercial stain removal product.
10. Household soap or detergent
11. Two bowls
12. Brushes
13. Clean rags and paper towels

Procedure

1. Record fiber content of your garment fashion fabric and specific care instructions for cleaning.
2. Read instructions on the manufacturer's label of the stain removal product.
3. Lay your samples on a clean dry surface, spread 1/4 teaspoon of ketchup, crayons, ink from pen, mustard and juice on different samples.
4. Try to wipe up the excess food item with a paper towel.
5. Clean one spot using a mixture of 1 Tablespoon white vinegar and 4 Tablespoons of water. Rub the area lightly with a soft rag. Pat out excess moisture.
6. Use the stain removal product on one spot according to the manufacturer's instructions.
7. Clean one spot with plain hot water, rubbing out the excess moisture.
8. Clean one spot with plain cold water, rubbing out the excess moisture.
9. Clean one spot with warm water and a small amount of detergent.
10. Allow the fabric to dry completely.
11. Record observations.

Experiment #13 - Stain Removal

Observations

Stain Removal Method	Appearance of Stain
Vinegar and Water	
Stain Removal Product	
Hot Water	
Cold Water	
Warm Water and Soap or Detergent	

Experiment #13 - Stain Removal

Conclusions

- Which method or methods removed the food stain the best?
- What similar characteristics can be observed about all of the stains?
- Which method would be a wise choice for you to use? Why?
- What commercial product instructions were important to observe?
- What information did you find regarding the fiber content or suggested care for your garment fashion fabric? How might that impact the stain removal method you use?
- What other fiber/fabrics around your home may require stain removal methods? Do you think the results would be the same? Different? Why?

Experiment #14 - Design Your Own

Using some of the suggested activities(*) or your own ideas, create an experiment.

- What do you want to find out?

- Materials Needed?

- Procedures to follow:

- Observations: (chart, graph, etc.)

- Conclusions:
  - Discuss two situations in which the information you learned would be helpful.

Colorado 4-H Mission
4-H empowers youth to reach their full potential by working and learning in partnership with caring adults.

Colorado 4-H Vision
A world in which youth and adults learn, grow and work together

4-H Pledge
I pledge.....
My head to clearer thinking,
My heart to greater loyalty,
My hands to larger service,
My health to better living
for my club, my community,
my country and my world.

Promesa 4-H
Prometo usar mi mente para pensar con más claridad,
mi corazón para ser más leal,
mis manos para ser más servicial,
mi salud para cuidarme más,
por mi club, mi comunidad, mi país y mi mundo.

4-H Motto
“To Make the Best Better.”

COLORADO STATE UNIVERSITY
EXTENSION

Colorado4h.org