

Study and Review Questions plus NEW Table-Top Labs* for users of *The Textile Kit*

*ONLY included in the Instructor's Edition
Also available on our website at www.atexinc.com

The following **Study and Review Questions** help students integrate information from their textbook and lecture to apply what they have learned to the study of samples in *The Textile Kit*. Plus in response to requests for simple labs, we have developed **NEW Table-Top Labs**. These are user friendly adaptations of some of the popular labs performed at colleges and universities. We hope these exercises provide the experiences students need to better understand textiles.

Use these teaching tools in a number of ways:

- In-class small group projects
- Individual student self-study outside class
- Review for exams
- Classroom discussion
- Laboratory exercises
- Exam questions (we like every exam to feature an applications section)
- Graded, ungraded or self-graded

The “**KEY**” accompanying these exercises provides answers to questions relating to specific samples in *The Textile Kit*. However, because we recognize different teaching approaches and textbooks, we encourage you to accept any suitable answer in addition to the answers we have suggested.

Suggestions for mounting and labeling the samples are included on the first page of each copy of *The Textile Kit*, although you may wish to provide supplemental instructions and guidance to your students. Some instructors have students write in the information for each sample outside class (this may take several hours) and devote a period in class to overseeing students as they attach the samples. Please contact us if you need more information.

Thank you for choosing *The Textile Kit* from ATEXINC!

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The Textile Kit

SRQ 1: Natural Fibers

Name: _____

Study and Review Questions

Using samples from **The Textile Kit**, answer the following questions:

1-1. Sample #60 Fiber content: _____

Fabric name: _____

a. Identify **three** advantages of this **fiber**:

b. Identify **three** limitations of this **fiber**:

c. Sample #56 is an example of carded cotton. Define **carded**:

d. Find a sample fabric containing combed cotton.

Sample # _____ Fabric Name: _____

Define **combed**:

1-2. Sample #6 Fiber content:_____

Fabric name:_____

a. Define **Pima** cotton:

b. Compare **Pima** cotton to **Upland** cotton:

c. Identify **two** other fine, long-staple varieties of cotton:

1-3. Sample #8 Fiber content:_____

Fabric name:_____

a. Identify **three** advantages of this **fiber**:

b. Identify **three** limitations of this **fiber**:

1-4. Sample #7 Fiber content: _____

Fabric name: _____

a. Define **naturally colored cotton**:

b. Why are **naturally colored cottons** of interest to both industry and consumers?

1-5. Sample #18 Fiber content: _____

Fabric name: _____

Sample #19 Fiber content: _____

Fabric name: _____

a. Identify which sample/s are made of **staple** fibers: _____

b. Identify which sample/s are made of **filament** fibers: _____

c. Silkworms producing **cultivated** silk are fed: _____

d. **Bombyx mori** is: _____

1-6. Sample #15 Fiber content: _____

Fabric name: _____

a. What is the **animal origin** of the predominant fiber in this sample?

b. List **two** properties of this **fiber** that differ from those of sheep's wool:

1-7. Identify the **cellulosic** fibers in each of the following samples. Then place a check mark in the appropriate column/s to identify the cellulosic category of each fiber.

	<u>Fiber/s</u>	<u>Seed Hair</u>	<u>Bast</u>	<u>Leaf</u>
Sample #9	_____	_____	_____	_____
Sample #10	_____	_____	_____	_____
Sample #11	_____	_____	_____	_____
Sample #12	_____	_____	_____	_____
Sample #57	_____	_____	_____	_____

1-8. Identify and tell the origins of 3 **minor** cellulosic fibers and 3 **minor** protein fibers **not shown** as samples in **The Textile Kit**:

a. **Minor** cellulosic fibers:

b. **Minor** protein fibers:

1-9. Sample #13 Fiber content:_____

Fabric name:_____

- a. Suggest an **end use** for this fabric:

- b. Justify your choice in terms of **fiber properties**:

1-10. **Identify** the significance of the following terms:

- a. mercerization:

- b. green cotton:

- c. organic cotton:

- d. beetling:

- e. Merino wool:

- f. virgin wool:

1-10. (continued)

g. lamb's wool:

h. sericulture:

i. wild silk:

j. raw silk:

k. duppioni silk:

l. pure dye silk:

1-11. Draw a line to match each fiber type with its microscopic appearance.

- | | |
|------------------|---------------------------|
| a. wool | twisted ribbon |
| b. silk | smooth longitudinal lines |
| c. cotton | noded, like bamboo |
| d. flax | overlapping scales |

The End

2-3. Sample #82 Fiber content:_____

Fabric name:_____

a. Identify **three** advantages of this **fiber** to make a wedding gown:

b. Identify **three** limitations of this **fiber**:

2-4. Sample #28 Fiber content:_____

Fabric name:_____

a. **Recycled fibers** are becoming an important part of our lives. Identify **two** reasons that consumers might prefer products made of recycled fibers:

b. Identify **two** items that can be **recycled** into textiles:

c. Identify **two** items that can be **made from recycled textile products**:

2-5. Sample #26 Fiber content: _____

Fabric name: _____

Sample #27 Fiber content: _____

Fabric name: _____

a. List **two** advantages of the fabric made from **microdenier fibers** over the fabric made from regular-denier fibers.

b. List **two** advantages of the fabric made from **regular-denier fibers** over the fabric made from microdenier fibers.

2-6. Sample #34 Fiber content: _____

Fabric name: _____

Sample #48 Fiber content: _____

Fabric name: _____

Compare and contrast the properties of the **elastomeric fibers** in these two samples:

- 2-7. Select a **100% nylon** sample fabric that you would recommend for use in producing windbreaker jackets.

Sample # _____ Fabric name: _____

In terms of **fiber properties**, justify why the fiber would be a good choice for this **end use**.

- 2-8. Sample #32 Fiber content: _____

Fabric name: _____

In terms of **fiber properties**, justify why the fiber would be a good choice for this **end use**.

- 2-9. Sample #33 Fiber content: _____

Fabric name: _____

- a. So-called "contract fabrics" have been laboratory tested to provide data showing how well they meet the performance standards as specified in commercial building contracts. What **fiber property** makes modacrylic desirable in contract applications?

- b. Find another sample fabric number that is inherently flame resistant:

Sample # _____ Fiber content: _____

2-10. Sample #30 Fiber content:_____

Fabric name:_____

- a. Identify two **end uses** for **Tyvek®**:

- b. List **two** of the advantages of this **fiber**:

- c. List **two** limitations of this **fiber**:

2-11. Sample #56 Fiber content:_____

Fabric name:_____

Sample #93 Fiber content:_____

Fabric name:_____

Using these samples as a "**base**", compare and contrast the fiber properties of **natural** and **manufactured/synthetic** fibers (of course, there are natural and manufactured fibers other than cotton and polyester):

2-12. Fill in a sample number **and** fiber name associated with the following:

	<u>Sample #</u>	<u>Fiber Name</u>
polyamide	_____	_____
aromatic polyamide	_____	_____
first manufactured fiber	_____	_____
best imitates wool	_____	_____
inherently flame retardant	_____	_____
first synthetic fiber	_____	_____
first heat sensitive fiber	_____	_____
polyurethane	_____	_____
elastomeric	_____	_____
polyethylene	_____	_____
versatility in blending	_____	_____
color scavenger	_____	_____
fume fading	_____	_____
latent shrinkage potential	_____	_____
softest synthetic fiber	_____	_____
most resembles cotton	_____	_____
most-used fiber overall	_____	_____
lightest weight fiber	_____	_____

2-13. Fill in a sample number **and** fiber name associated with the following trademarks:

	<u>Sample #</u>	<u>Fiber Name</u>
Tencel®	_____	_____
Celanese®	_____	_____
Fortrel®	_____	_____
Lycra®	_____	_____
Dacron®	_____	_____
Polynosic®	_____	_____
Supplex®	_____	_____
Gore-Tex®	_____	_____
Tyvek®	_____	_____
Nomex®	_____	_____
EcoSpun™	_____	_____
SEF-Plus™	_____	_____
Corterra®	_____	_____
Micromattique®	_____	_____
Tactel®	_____	_____

The End

The Textile Kit

Name: _____

SRQ 3: Yarns Study and Review Questions

Using samples from **The Textile Kit**, answer the following questions:

- 3-1. Pull yarns from the following samples and untwist them. Place a check mark in the appropriate column to identify which samples are made of **spun yarns** (staple fibers) and which are made of **filament yarns** (filament fibers).

<u>Fabric Name</u>	<u>Spun Yarns</u>	<u>Filament Yarns</u>
Sample #21 _____	_____	_____
Sample #23 _____	_____	_____
Sample #26 _____	_____	_____
Sample #45 _____	_____	_____
Sample #51 _____	_____	_____
Sample #52 _____	_____	_____
Sample #53 _____	_____	_____
Sample #81 _____	_____	_____
Sample #82 _____	_____	_____
Sample #166 _____	_____	_____

- 3-2. a.** Find a sample fabric containing **smooth-filament yarns**:
- Sample # _____ Fabric Name _____
- a.** Find a sample fabric containing **bulk-continuous filament yarns**:
- Sample # _____ Fabric Name _____
- c.** List **three** characteristics of **bulk** yarns that differ from those of smooth-filament yarns:
-
- 3-3.** Sample #13 Fabric name: _____
- Fiber content: _____
- Sample #14 Fabric name: _____
- Fiber content: _____
- a.** Define **woolen**:
-
- b.** Define **worsted**:
-
- c.** What two **cotton processes** parallel these two wool processes?
-
- 3-4.** Compare and contrast the **performance** of **ring-spun** yarns versus the performance of **open-end-spun** yarns (OE yarns).

3-5. a. Define **TPI**:

b. Identify **three** fabric properties resulting from increased **yarn twist**.

3-6. Match each sample to its amount of **yarn twist**.

	<u>Fabric Name</u>	
_____ Sample #50	_____	a. low twist
_____ Sample #57	_____	b. napping twist
_____ Sample #58	_____	c. average twist
_____ Sample #85 (warp)	_____	d. hard twist
_____ Sample #85 (filling)	_____	e. crepe twist

3-7. Sample #63 Fiber content: _____

Fabric name: _____

a. This fabric contains an intimate fiber **blend**. Define intimate blend:

b. Identify the **stage/s** in production at which fibers are blended:

- 3-8. a. Identify **two** main contributions of the **primary** fiber in the blend used in Sample #63 see previous question):
- b. Identify **two** main contributions of the **secondary** fiber in the blend:
- c. Identify **two advantages** of this **blend**:

3-9. Sample #35 Fiber content: _____

Fabric name: _____

- a. Identify **two** main contributions of the **primary** fiber in the blend:
- b. Identify **two** main contributions of the **secondary** fiber in the blend:
- c. Identify **two advantages** of this **blend**:

3-10. **Yarn size** may be referred to as **yarn number, denier, or tex.**

- a. **Spun yarn** size is referred to as _____ or _____.
- b. **Filament yarn** size is referred to as _____ or _____.
- c. Identify **two** ways in which the **tex** system is superior to the use of yarn number and denier for expressing yarn size.

3-11. Define, in your own words, the following types of **yarns**. Then find a yarn that represents each type, pull it from its sample fabric, and mount it next to its description, using clear adhesive tape.

- a. monofilament
- b. simple single
- c. ply
- d. BCF
- e. chenille
- f. crepe
- g. slub
- h. tweed
- i. bouclé
- j. ratiné
- k. metallic
- l. covered/composite

The End

The Textile Kit

SRQ 4: Woven Fabrics

Name: _____

Study and Review Questions

Using samples from **The Textile Kit**, answer the following questions:

4-1. Sample #3 Fabric name: _____

Weave type: _____

Sample #79 Fabric name: _____

Weave type: _____

Sample #82 Fabric name: _____

Weave type: _____

Using the above fabrics as reference for the **three main weave types**, indicate whether each characteristic is most closely associated with the plain, twill, or satin weave by writing a **P** for plain, **T** for twill, or **S** for satin in the blank.

_____ apt to snag _____ wrinkles easily

_____ hides soil _____ retains soil

_____ wind resistant _____ ravel least

_____ diagonal ridges _____ most lustrous

_____ ravel most _____ basket weave

_____ most durable _____ long floats

_____ pressure and wear cause fabric to shine

_____ no technical face and back as a result of the weave

_____ requires as few as two harnesses arrangements to weave

_____ unbalanced produces horizontal ridges

4-2. Match each sample to its **weave type** and fill in the name of the sample.

_____	Sample #40 _____	a. dobby
_____	Sample #58 _____	b. plain unbalanced
_____	Sample #63 _____	c. jacquard
_____	Sample #70 _____	d. even-sided twill
_____	Sample #74 _____	e. slack-tension
_____	Sample #78 _____	f. plain balanced
_____	Sample #81 _____	g. basket
_____	Sample #83 _____	h. double weave
_____	Sample #88 _____	i. warp-faced twill
_____	Sample #89 _____	j. momie
_____	Sample #94 _____	k. satin
_____	Sample #97 _____	l. pile
_____	Sample #98 _____	m. leno
_____	Sample #100 _____	
_____	Sample #102 _____	
_____	Sample #107 _____	

4-3. Sample #59 Fabric name: _____

Sample #72 Fabric name: _____

Sample #73 Fabric name: _____

Explain the **similarities and differences** in the **weave structures** of these fabrics.

4-4. Sample #3 Fabric name: _____

Fiber content: _____

Sample #41 Fabric name: _____

Fiber content: _____

Explain the **similarities and differences** in the **weave structures** of these fabrics.

4-5. Sample #83 Fabric name: _____

Sample #85 Fabric name: _____

Both these fabrics are made using a satin weave. How are they **different**?

4-6. Sample #77 Fabric name:_____

Sample #164 Fabric name:_____

Using the terms "**structural design**" and "**applied design**", explain the **differences** in these two houndstooth fabrics.

4-7. Sample #66 Fabric name:_____

Fiber content:_____

Sample #80 Fabric name:_____

Fiber content:_____

Compare and contrast the impact of the **weave construction** of these fabrics on performance if used to manufacture casual slacks.

4-8. Sample #85 Fabric name:_____

Fiber content:_____

Explain how this fabric is **woven** to achieve this look:

4-11. Sample #103 Fabric name: _____

Fiber content: _____

Sample #104 Fabric name: _____

Fiber content: _____

a. Define **warp pile**:

b. Define **filling pile**:

c. Sample #102 (warp or filling pile?) _____

Sample #103 (warp or filling pile?) _____

Sample #104 (warp or filling pile?) _____

Sample #106 (warp or filling pile?) _____

d. Besides **weave structure**, what feature distinguishes **velvet** and **velveteen**?

e. How is the pile **created** differently in **terrycloth** than it is in **velvet**?

The End

The Textile Kit

Name: _____

SRQ 5: Knits and Other Fabrics Study and Review Questions

Using samples from **The Textile Kit**, answer the following questions:

5-1. Match each sample to its description.

Fabric Name

_____	Sample #34_____	a. simplest warp single knit
_____	Sample #115_____	
_____	Sample #118_____	b. Raschel knit
_____	Sample #119_____	
_____	Sample #120_____	c. simplest filling single knit
_____	Sample #123_____	
_____	Sample #124_____	d. double knit/rib gaiting
_____	Sample #125_____	
_____	Sample #126_____	e. pile knit
_____	Sample #127_____	
_____	Sample #128_____	f. double knit/ interlock gaiting
_____	Sample #129_____	
_____	Sample #131_____	g. rib knit
_____	Sample #133_____	
_____	Sample #135_____	h. tuck-stitch knit
_____	Sample #136_____	

5-2. Sample #115 Fabric name: _____

Sample #3 Fabric name: _____

a. After comparing these samples as representative of knit and woven fabrics, identify **three** advantages of **knit fabrics**:

b. Identify **three** limitations of **knit fabrics**:

c. The vertical rows of stitches on the **face** of #115 are: _____

d. The horizontal rows of stitches on the **back** of #115 are: _____

5-3. Sample #115 Fabric name: _____

Sample #131 Fabric name: _____

a. Identify the **main similarity** in the **structure** of these two fabrics:

b. Identify the **main difference** in the **structure** of these two fabrics:

5-4. Sample #115 Fabric name:_____

Sample #117 Fabric name:_____

a. Identify the **main similarity** in the **stitches** of these two fabrics:

b. Identify the **main difference** in the **stitches** of these two fabrics:

c. Identify the **main difference** in the **performance** of these fabrics.

5-5. Sample #127 Fabric name:_____

Sample #128 Fabric name:_____

a. Identify the **main similarity** in the **stitches** of these two fabrics:

b. Identify the **main difference** in the **stitches** of these two fabrics:

5-6. Sample #120 Fabric name:_____

Sample #136 Fabric name:_____

a. Identify the **main similarity** in the **construction** of these fabrics:

b. Identify the **main difference** in the **stitches** of these fabrics:

5-7. Sample #148 Fabric name:_____

Sample #149 Fabric name:_____

a. Identify **two** similarities in these **quilted fabrics**:

b. Identify **two** differences in these **quilted fabrics**:

5-8. Sample #30 Fabric name:_____

Fiber content:_____

Sample #141 Fabric name:_____

Fiber content:_____

Sample #143 Fabric name:_____

Fiber content:_____

a. What **structural characteristic** do these three fabrics **share**?

b. What **three** different **structural processes** are used to create these three different fabrics?

5-9. Sample #150 Fabric name:_____

Explain how this fabric is **constructed**:

5-10. Sample #158 Fabric name:_____

a. Is the design on this fabric **structural** or **applied**?

b. Compare the serviceability and cost of this **flocked** sample with those of a "true" dotted swiss:

5-11. Sample #38 Fabric name:_____

Fiber content of membrane:_____

Describe the **performance advantages** of this **microporous** fabric:

5-12. Sample #142 Fabric name:_____

Describe the **advantages** of this fabric:

5-13. Sample #138 Fabric name: _____

Fiber content: _____

Sample #139 Fabric name: _____

Fiber content: _____

a. Identify the **main similarity** in the structures of these two fabrics.

b. Identify the **main difference** in the structure of these two fabrics:

5-14. a. Define **laminated**:

b. Find two sample fabric numbers that are **laminated**

Sample #

Fabric Name

5-15. Sample #143 Fabric name: _____

Compare and contrast the **structure** of leather and “imitation leather” such as Naugahyde® or pleather.

The End

The Textile Kit

Name: _____

SRQ 6: Dyes/Prints/Finishes Study and Review Questions

Using samples from **The Textile Kit**, answer the following questions:

6-1. Sample #65 Fabric name: _____

Sample #166 Fabric name: _____

Using the terms "**applied design**" and "**structural design**", explain the **differences** in these moiré designs:

6-2. Sample #58 Fabric name: _____

Sample #165 Fabric name: _____

Using the terms "**applied design**" and "**structural design**", explain the **differences** in these gingham check designs:

6-3. Sample #152 Fabric name: _____

Fiber content: _____

This cotton is mercerized. Explain the **effects of mercerization**:

6-4. Sample #51 Fabric name: _____

Fiber content: _____

Sample #55 Fabric name: _____

Fiber content: _____

One of the known fiber properties of cotton is its softness. **Why** are these two fabric samples **stiff**?

6-5. Sample #13 Fabric name: _____

Fiber content: _____

a. Define **stock/fiber dyed**:

b. Define **piece dyed**:

c. Is this fabric stock dyed or piece dyed?

6-8. a. Define **napped**:

b. Identify three sample fabrics that are napped:

<u>Sample #</u>	<u>Fabric Name</u>
_____	_____
_____	_____
_____	_____

c. Why are fabrics **napped**?

6-9. Sample #138 Fabric name: _____

Fiber content: _____

Sample #156 Fabric name: _____

Fiber content: _____

a. The raised pattern/design in these fabrics is: _____

b. The raised pattern/design was created by (technique):

on Sample #138: _____

on Sample #156: _____

c. **Compare** plissé to Sample # 107 seersucker; how is the raised pattern/design created on seersucker? (Hint: It is **not** a finish.)

6-10. Sample #170 Fabric name: _____

Fiber content: _____

Sample #171 Fabric name: _____

Fiber content: _____

a. Explain the **resist process** used to create batik:

b. Explain the **resist process** used to create tie dye:

6-11. a. Find two sample fabric numbers that are **direct roller prints**:

<u>Sample #</u>	<u>Fabric Name</u>
_____	_____
_____	_____

b. Find two sample fabric numbers that are **screen prints**:

<u>Sample #</u>	<u>Fabric Name</u>
_____	_____
_____	_____

c. Using these samples as a basis, **which process** would you suggest for printing a relatively large-scale design (versus a small-scale, classic design)?

6-12. Match each sample to its description.

		<u>Fabric Name</u>	
_____	Sample #8	_____	a. mothproof
_____	Sample #14	_____	b. permanent press
_____	Sample #40	_____	c. burned out
_____	Sample #49	_____	d. Scotchgard®
_____	Sample #51	_____	e. anti-static
_____	Sample # 4	_____	f. sequined
_____	Sample #61	_____	g. sueded/emerged
_____	Sample #83	_____	h. parchmented
_____	Sample #132	_____	i. chemical wash
_____	Sample #153	_____	j. glazed
_____	Sample #154	_____	k. pressed
_____	Sample #155	_____	l. embroidered
_____	Sample #157	_____	m. pleated
_____	Sample #159	_____	n. brushed
_____	Sample #160	_____	o. one dye bath, multiple colors
_____	Sample #161	_____	p. Teflon®
_____	Sample #163	_____	q. beetled
_____	Sample #168	_____	r. bleached

The End

Table-Top Labs: READ THIS FIRST!

Objectives: Before beginning the lab exercises, you will learn about safety practices and general laboratory policies to be followed at all times when you are performing lab exercises. Please review this page as often as necessary.

Rationale: The safety practices and general laboratory policies on this page will ensure the smooth performance of the lab exercises and help guard against accidental injuries.

Part A: Safety Practices: So-called “Table-Top Labs” are useful because they can be performed not only in traditional laboratory facilities but also, because they require simple equipment, in classrooms (with permission from your institution) or even at home. However, standard safety practices must be followed regardless of where lab exercises are performed. Important rules include:

1. Have **adult supervision** at all times during laboratory exercises.
2. Use **common sense** at all times, especially in dealing with chemicals, fire, stoves, ovens, and microwaves.
3. **NO EATING, DRINKING, OR SMOKING** while performing laboratory exercises.
4. **DO NOT INHALE, INGEST, OR TASTE ANY SUBSTANCE** with which you are working. Do not perform labs using utensils in which food will be prepared.
5. **Safety glasses** with side shields or safety goggles are required as eye protection. They must be worn at all times chemicals or flames are used.
6. To minimize hazard, **tie back long hair** securely. Apparel: NO shorts, NO bare feet. NO open-toed shoes, all for safety reasons. Students are encouraged to wear a lab apron or lab coat.
7. Provide for **adequate ventilation**. Keep chemicals away from flames. Have a **fire extinguisher** nearby when performing burn tests in case of emergency.
8. **Read safety information** on all equipment and materials.
9. **Follow directions** for each exercise. Always read the instructions BEFORE beginning. Do NOT alter the experiment without your instructor’s approval.
10. **Always ask** for exercises, procedures, or problems to be clarified before starting any exercise. Do not attempt to proceed with an exercise if you are unclear about what is expected or required.

I have read the above Safety Practices and General Laboratory Policies and agree to abide by these rules for the safety and enjoyment of myself and others.

Signature

Date

Part B: General Laboratory Policies: Some other policies that will help you have a more successful experience:

1. Prepare each day by reviewing the text and lab exercise before coming to class.
2. Clean your own laboratory space, equipment, and materials. Also assist in maintaining and cleaning the common areas of the laboratory.
3. Lab reports are due on the date specified by the instructor.

LAB 1: Using Fiber Identification Stains

Objective: Using fiber identification stains to see how different fibers selectively absorb dyes.

Rationale: By observing how different fibers selectively absorb dyes based on the fiber's chemical composition, you will understand the need to carefully develop dye formulas to achieve a "union" of the same shade when dyeing a blended fabric (for example, 65% polyester, 35% cotton). Also, you will appreciate the challenge of dyeing an acetate lining to the exact same shade as a wool jacket, or dyeing coordinating separates (tops and bottoms, for example) made from different fibers. And you will better understand the ability of a fabric with stripes or plaids woven from different fibers to be cross dyed in a single dye bath (formulated with dyes that will dye each fiber a different color) to produce a multi-color striped or plaid fabric.

Introduction: In this lab, you will stain a sample of multi-fiber fabric using Fiber Identification Stains. Fiber identification stains contain several different classes of dyes which selectively dye specific fibers depending on their chemical composition. Your multi-fiber fabric sample contains acetate, acrylic, cotton, nylon, polyester, and wool. By dyeing the fabric with Fiber Identification Stains, you should be able to identify each fiber by comparing it to the key provided by your instructor (or log on to www.atexinc.com).

Fiber identification stains were developed to identify unknown fibers. (Note: For best results, use both Stain No. 1 and Stain No. 3A when identifying fibers. Identification stains are not suitable for identifying fibers or fabrics which have been previously dyed or printed. Finishes may also change dye affinity and affect test results when using identification stains.)

Materials Required: Swatch of multi-fiber fabric* (Sample #5 in **The Textile Kit**)
 Fiber Identification Stain No. 1 and No. 3A *
 Distilled white vinegar
 Heat source
 Cold soapy water and cold rinse water
 Heat-resistant beaker or pan for boiling solutions
 Paper towels

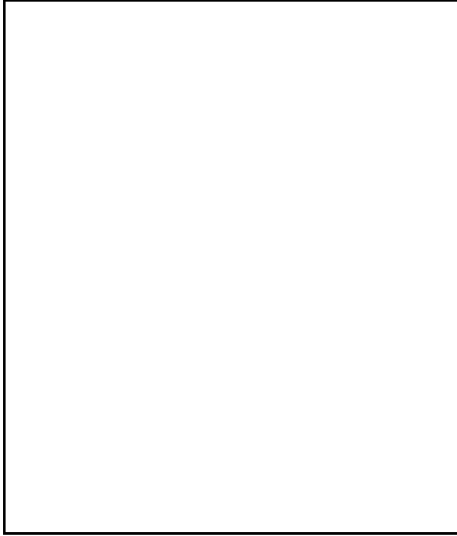
Procedures:

1. Cut your swatch of multi-fiber fabric into two pieces (be sure to cut lengthwise so that all fiber types are represented in each sample).
2. Dissolve 50 mg of Fiber Identification Stain No. 1 in 100 ml hot water. Bring to a boil. Immerse sample of multi-fiber fabric for 5 minutes at boiling temperature. Wash in cold soapy water and then rinse thoroughly in cold water and dry.
3. Dissolve 50 mg of Fiber Identification Stain No. 3A in 100 ml hot water. Bring to a boil. Add .5 ml to 1 ml of distilled white vinegar. Immerse sample of multi-fiber fabric for 5 minutes at boiling temperature. Wash in cold soapy water and then rinse thoroughly in cold water and dry.
4. Using tape, mount your samples on the answer sheet.
5. Compare your samples to the key provided by your instructor (or log on to www.atexinc.com) and identify each fiber on the answer sheet.
6. Complete the answer sheet.

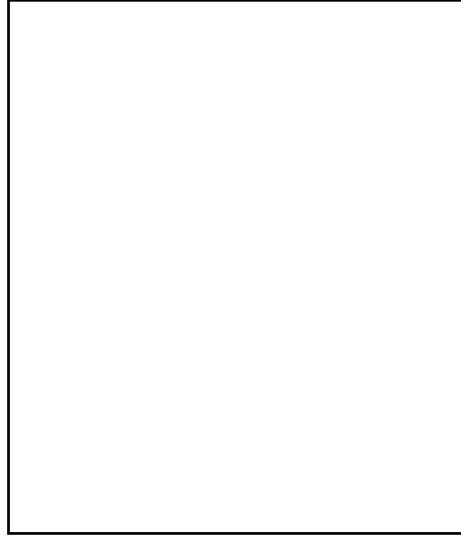
*available from Textile Innovators Corporation, Windsor, NC, phone 252-794-9703, fax 252-794-9704

LAB 1: Answer Sheet

Name: _____



Multi-fiber fabric
Dyed using Fiber Identification Stain No. 1



Multi-fiber fabric
Dyed using Fiber Identification Stain No. 3A

1. Starting at the top, identify each fiber type:

First: _____

Second: _____

Third: _____

Fourth: _____

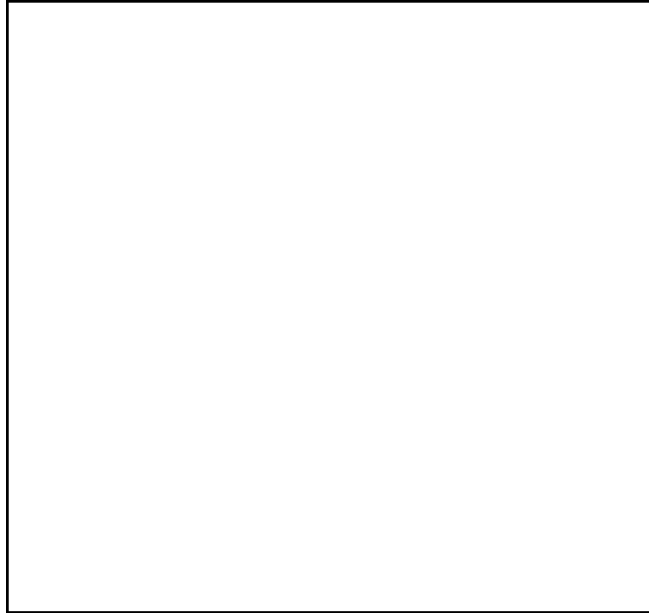
Fifth: _____

Sixth: _____

2. Explain the challenges of union dyeing blended fabrics:

LAB 1: Answer Sheet (continued)

3. Sketch a striped or plaid fabric and diagram the fiber types to be used in weaving it to achieve a multi-colored finished fabric via cross dyeing in a single dye bath. Explain your answer below.



4. Explain why it is difficult to dye the polyester binding on the neckline of a cotton t-shirt to the exact same shade as the t-shirt fabric.

LAB 2: Identification of Fibers by Burning

Objective: To learn how to identify unknown fibers by burning. The three most common methods used to identify fibers are 1) burning test, 2) microscopic examination, and 3) solubility analysis.

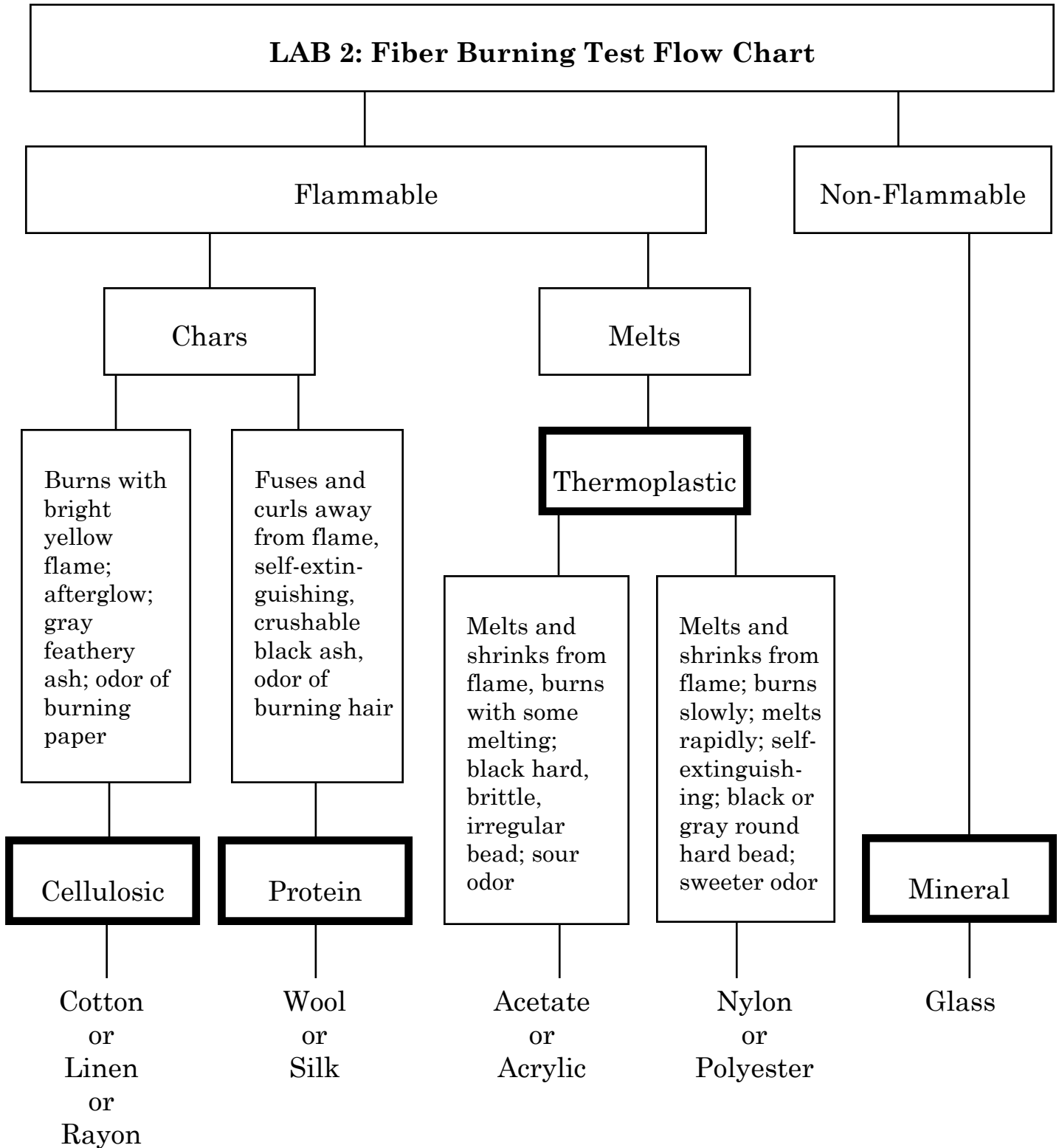
Rationale: The ability to perform fiber identification can confirm fiber i.d. and label accuracy and can yield important information about textile products with missing labels as well as about historic items that predate today's labeling requirements. Correct fiber identification on a garment is a federal regulation overseen by the Federal Trade Commission; U.S. Customs enforces this regulation on imported products.

Introduction: For both natural and manufactured fibers, the burning test is used to identify general groups of fibers—cellulosics, proteins, synthetics and minerals—rather than specific generic fibers. This lab involves fabrics made 100% from single fiber types. Fiber identification is more difficult when a fabric contains more than one fiber type.

Materials Required: Tweezers (or sewing bodkin)
 Short candle and matches or lighter
 Disposable pie tin
 Scissors and tape
 Samples: cotton, linen, wool, silk, rayon, acetate, nylon, polyester, acrylic

Procedures:

1. **SAFETY PRECAUTIONS:** Tie back long hair, wear eye protection, roll up long sleeves if not wearing a lab coat and provide adequate ventilation during this lab. Avoid breathing smoke or fiber residue. **DO NOT HAVE ANY NAIL POLISH, NAIL POLISH REMOVER, RUBBER CEMENT OR OTHER GLUES, OR ANY OTHER CHEMICALS NEAR OPEN FLAMES!!!** Always use common sense when dealing with fire and have adult supervision.
2. Label samples A-I. Cut fabric samples into very narrow strips. Mount one strip from each sample in the space provided on the answer sheet.
3. Place candle in pie tin and light.
4. Hold one strip of fabric in tweezers and slowly approach the flame. Observe. You may wish to work with a partner or in a small group to help one another record observations.
5. Move the strip into the flame and observe burning behavior (e.g., color of flame, burning or melting, etc.—see charts on following pages). Record results on worksheet.
6. Remove the strip from the flame and observe burning behavior. Record. **DO NOT BLOW OUT THE FLAME**—if you do, burning sample material could fly or splatter and burn someone.
7. After the flame has gone out, drop residue into pie tin. Record any odor you observe (**REMEMBER, AVOID TAKING A DEEP BREATH OF SMOKE OR FIBER RESIDUE**).
8. After the residue or ash has cooled, touch it. Record results.
9. Repeat as many times as necessary to confirm and record all your observations for each fabric sample before moving to the next sample.
10. Refer to the “Fiber Burning Test Flow Chart” to determine the fiber group for each sample (cellulosic, protein, thermoplastic, mineral).
11. Then determine the specific fiber for each sample to the best of your ability by using your textbook and the “Fiber Burning Characteristics Chart.” This may be a “best guess” partly based on your knowledge of the hand and luster of each fiber and its common fabrications.
12. Write the fiber group and fiber name on the worksheet. You must correctly identify the **fiber group** for each sample. Complete answer sheet.



LAB 2: Fiber Burning Characteristics Chart

Fiber	Approaching Flame	In Flame	Removed from Flame	Odor	Residue
Cotton	Does not fuse or shrink away	Burns rapidly, bright yellow, no melting	Continues to burn; afterglow	Paper or wood	Small fluffy light gray ash
Linen	Does not fuse or shrink away	Burns rapidly, bright yellow, no melting	Continues to burn; afterglow	Paper or wood	Small fluffy light gray ash
Rayon	Does not fuse-shrink away	Burns rapidly	Leaves a creeping ember	Paper or wood	Small fluffy light gray ash
Wool	Fuses and curls away from flame	Burns slowly	Burns slowly, sometimes self-extinguishing	Strong hair or feather	Brittle, lumpy bead, a little harder than silk's
Silk	Fuses and curls away from flame	Burns slowly	Burns slowly, sometimes self-extinguishing	Slight hair or feather	Brittle, lumpy bead which powders when pressed
Acetate	Melts and shrinks away from flame	Sparks and melts	Continues to burn with melting	Vinegar, sour	Hard, brittle, black, irregular bead
Acrylic	Shrinks away from flame	Burns rapidly with some melting	Continues to burn with melting	Sour, acrid	Hard, brittle, black, irregular bead
Nylon	Melts and shrinks away from flame	Burns slowly, melts rapidly, often carries flame as it melts	Usually self-extinguishing	Cooked celery	Hard, round, tough gray bead
Polyester	Melts and shrinks away from flame	Burns slowly, melts rapidly, long black smoke	Usually self-extinguishing	Sweet, chemical	Hard, round, tough black bead
Glass	Will not burn	Will not burn	Will not burn	Wax	Flame will leave carbon residue, heat may change shape

** This chart summarize the standard burning characteristics of the major generic fiber types. Slight differences in the burning characteristics of your lab samples and the standards given here for the same generic fiber type may be due to the presence of various dyes and finishes, if any, as well as other attributes such as yarn twist and fabrication density which affect burning characteristics.*

LAB 2: Worksheet

(For each sample, circle as many burning characteristics as apply.)

Name: _____

Sample Info	Approaching Flame	In Flame	Removed from Flame	Odor	Residue
<p>A</p> <p>Tape piece of sample here:</p> <p>Fiber group:</p> <p>Fiber name:</p>	<p>a. doesn't fuse or shrink away</p> <p>b. fuses and curls away</p>	<p>a. burns rapidly</p> <p>b. burns a bright yellow</p> <p>c. no melting</p> <p>d. some melting</p> <p>e. sparks</p> <p>f. supports flame as it melts</p> <p>g. melts rapidly</p> <p>h. long dark smoke</p> <p>i. will not burn</p>	<p>a. continues to burn</p> <p>b. afterglow</p> <p>c. self-extinguishing</p> <p>d. melting</p>	<p>a. burned paper or wood</p> <p>b. burned hair or feathers</p> <p>c. non-specific chemical smell</p> <p>d. vinegar</p> <p>e. cooked celery</p> <p>f. wax</p>	<p>a. fluffy gray ash</p> <p>b. no ash</p> <p>c. brittle lumpy bead</p> <p>d. hard dark unbreakable bead</p> <p>e. hard gray or brown unbreakable bead</p> <p>f. carbon residue</p>
<p>B</p> <p>Tape piece of sample here:</p> <p>Fiber group:</p> <p>Fiber name:</p>	<p>a. doesn't fuse or shrink away</p> <p>b. fuses and curls away</p>	<p>a. burns rapidly</p> <p>b. burns a bright yellow</p> <p>c. no melting</p> <p>d. some melting</p> <p>e. sparks</p> <p>f. supports flame as it melts</p> <p>g. melts rapidly</p> <p>h. long dark smoke</p> <p>i. will not burn</p>	<p>a. continues to burn</p> <p>b. afterglow</p> <p>c. self-extinguishing</p> <p>d. melting</p>	<p>a. burned paper or wood</p> <p>b. burned hair or feathers</p> <p>c. non-specific chemical smell</p> <p>d. vinegar</p> <p>e. cooked celery</p> <p>f. wax</p>	<p>a. fluffy gray ash</p> <p>b. no ash</p> <p>c. brittle lumpy bead</p> <p>d. hard dark unbreakable bead</p> <p>e. hard gray or brown unbreakable bead</p> <p>f. carbon residue</p>
<p>C</p> <p>Tape piece of sample here:</p> <p>Fiber group:</p> <p>Fiber name:</p>	<p>a. doesn't fuse or shrink away</p> <p>b. fuses and curls away</p>	<p>a. burns rapidly</p> <p>b. burns a bright yellow</p> <p>c. no melting</p> <p>d. some melting</p> <p>e. sparks</p> <p>f. supports flame as it melts</p> <p>g. melts rapidly</p> <p>h. long dark smoke</p> <p>i. will not burn</p>	<p>a. continues to burn</p> <p>b. afterglow</p> <p>c. self-extinguishing</p> <p>d. melting</p>	<p>a. burned paper or wood</p> <p>b. burned hair or feathers</p> <p>c. non-specific chemical smell</p> <p>d. vinegar</p> <p>e. cooked celery</p> <p>f. wax</p>	<p>a. fluffy gray ash</p> <p>b. no ash</p> <p>c. brittle lumpy bead</p> <p>d. hard dark unbreakable bead</p> <p>e. hard gray or brown unbreakable bead</p> <p>f. carbon residue</p>

LAB 2: Worksheet (continued)

For each sample, circle as many burning characteristics as apply.)

Name: _____

Sample Info	Approaching Flame	In Flame	Removed from Flame	Odor	Residue
<p>D</p> <p>Tape piece of sample here:</p> <p>Fiber group:</p> <p>Fiber name:</p>	<p>a. doesn't fuse or shrink away</p> <p>b. fuses and curls away</p>	<p>a. burns rapidly</p> <p>b. burns a bright yellow</p> <p>c. no melting</p> <p>d. some melting</p> <p>e. sparks</p> <p>f. supports flame as it melts</p> <p>g. melts rapidly</p> <p>h. long dark smoke</p> <p>i. will not burn</p>	<p>a. continues to burn</p> <p>b. afterglow</p> <p>c. self-extinguishing</p> <p>d. melting</p>	<p>a. burned paper or wood</p> <p>b. burned hair or feathers</p> <p>c. non-specific chemical smell</p> <p>d. vinegar</p> <p>e. cooked celery</p> <p>f. wax</p>	<p>a. fluffy gray ash</p> <p>b. no ash</p> <p>c. brittle lumpy bead</p> <p>d. hard dark unbreakable bead</p> <p>e. hard gray or brown unbreakable bead</p> <p>f. carbon residue</p>
<p>E</p> <p>Tape piece of sample here:</p> <p>Fiber group:</p> <p>Fiber name:</p>	<p>a. doesn't fuse or shrink away</p> <p>b. fuses and curls away</p>	<p>a. burns rapidly</p> <p>b. burns a bright yellow</p> <p>c. no melting</p> <p>d. some melting</p> <p>e. sparks</p> <p>f. supports flame as it melts</p> <p>g. melts rapidly</p> <p>h. long dark smoke</p> <p>i. will not burn</p>	<p>a. continues to burn</p> <p>b. afterglow</p> <p>c. self-extinguishing</p> <p>d. melting</p>	<p>a. burned paper or wood</p> <p>b. burned hair or feathers</p> <p>c. non-specific chemical smell</p> <p>d. vinegar</p> <p>e. cooked celery</p> <p>f. wax</p>	<p>a. fluffy gray ash</p> <p>b. no ash</p> <p>c. brittle lumpy bead</p> <p>d. hard dark unbreakable bead</p> <p>e. hard gray or brown unbreakable bead</p> <p>f. carbon residue</p>
<p>F</p> <p>Tape piece of sample here:</p> <p>Fiber group:</p> <p>Fiber name:</p>	<p>a. doesn't fuse or shrink away</p> <p>b. fuses and curls away</p>	<p>a. burns rapidly</p> <p>b. burns a bright yellow</p> <p>c. no melting</p> <p>d. some melting</p> <p>e. sparks</p> <p>f. supports flame as it melts</p> <p>g. melts rapidly</p> <p>h. long dark smoke</p> <p>i. will not burn</p>	<p>a. continues to burn</p> <p>b. afterglow</p> <p>c. self-extinguishing</p> <p>d. melting</p>	<p>a. burned paper or wood</p> <p>b. burned hair or feathers</p> <p>c. non-specific chemical smell</p> <p>d. vinegar</p> <p>e. cooked celery</p> <p>f. wax</p>	<p>a. fluffy gray ash</p> <p>b. no ash</p> <p>c. brittle lumpy bead</p> <p>d. hard dark unbreakable bead</p> <p>e. hard gray or brown unbreakable bead</p> <p>f. carbon residue</p>

LAB 2: Worksheet (continued)

For each sample, circle as many burning characteristics as apply.)

Name: _____

Sample Info	Approaching Flame	In Flame	Removed from Flame	Odor	Residue
<p>G</p> <p>Tape piece of sample here:</p> <p>Fiber group:</p> <p>Fiber name:</p>	<p>a. doesn't fuse or shrink away</p> <p>b. fuses and curls away</p>	<p>a. burns rapidly</p> <p>b. burns a bright yellow</p> <p>c. no melting</p> <p>d. some melting</p> <p>e. sparks</p> <p>f. supports flame as it melts</p> <p>g. melts rapidly</p> <p>h. long dark smoke</p> <p>i. will not burn</p>	<p>a. continues to burn</p> <p>b. afterglow</p> <p>c. self-extinguishing</p> <p>d. melting</p>	<p>a. burned paper or wood</p> <p>b. burned hair or feathers</p> <p>c. non-specific chemical smell</p> <p>d. vinegar</p> <p>e. cooked celery</p> <p>f. wax</p>	<p>a. fluffy gray ash</p> <p>b. no ash</p> <p>c. brittle lumpy bead</p> <p>d. hard dark unbreakable bead</p> <p>e. hard gray or brown unbreakable bead</p> <p>f. carbon residue</p>
<p>H</p> <p>Tape piece of sample here:</p> <p>Fiber group:</p> <p>Fiber name:</p>	<p>a. doesn't fuse or shrink away</p> <p>b. fuses and curls away</p>	<p>a. burns rapidly</p> <p>b. burns a bright yellow</p> <p>c. no melting</p> <p>d. some melting</p> <p>e. sparks</p> <p>f. supports flame as it melts</p> <p>g. melts rapidly</p> <p>h. long dark smoke</p> <p>i. will not burn</p>	<p>a. continues to burn</p> <p>b. afterglow</p> <p>c. self-extinguishing</p> <p>d. melting</p>	<p>a. burned paper or wood</p> <p>b. burned hair or feathers</p> <p>c. non-specific chemical smell</p> <p>d. vinegar</p> <p>e. cooked celery</p> <p>f. wax</p>	<p>a. fluffy gray ash</p> <p>b. no ash</p> <p>c. brittle lumpy bead</p> <p>d. hard dark unbreakable bead</p> <p>e. hard gray or brown unbreakable bead</p> <p>f. carbon residue</p>
<p>I</p> <p>Tape piece of sample here:</p> <p>Fiber group:</p> <p>Fiber name:</p>	<p>a. doesn't fuse or shrink away</p> <p>b. fuses and curls away</p>	<p>a. burns rapidly</p> <p>b. burns a bright yellow</p> <p>c. no melting</p> <p>d. some melting</p> <p>e. sparks</p> <p>f. supports flame as it melts</p> <p>g. melts rapidly</p> <p>h. long dark smoke</p> <p>i. will not burn</p>	<p>a. continues to burn</p> <p>b. afterglow</p> <p>c. self-extinguishing</p> <p>d. melting</p>	<p>a. burned paper or wood</p> <p>b. burned hair or feathers</p> <p>c. non-specific chemical smell</p> <p>d. vinegar</p> <p>e. cooked celery</p> <p>f. wax</p>	<p>a. fluffy gray ash</p> <p>b. no ash</p> <p>c. brittle lumpy bead</p> <p>d. hard dark unbreakable bead</p> <p>e. hard gray or brown unbreakable bead</p> <p>f. carbon residue</p>

LAB 2: Answer Sheet

1. Identify the general burning characteristics of cellulosic fibers (e.g., ability to support flame, speed of burning, afterglow, odor, residue, etc.)

2. Identify the general burning characteristics of protein fibers (e.g., ability to support flame, speed of burning, afterglow, odor, residue, etc.)

3. Identify the general burning characteristics of synthetic fibers (e.g., ability to support flame, speed of burning, afterglow, odor, residue, etc.)



LAB 3: Heat Setting of Yarns

Objective: To gain a better understanding of the relationship of thermoplastic fibers to the heat setting of yarns (and thus fabrics).

Rationale: Understanding how thermoplastic fibers affect the heat setting of yarns (and fabrics) will help students predict which yarns (and fabrics) can be heat set.

Introduction: In this lab, students will attempt to heat set one yarn made of thermoplastic fibers and one yarn made of non-thermoplastic fibers to demonstrate which type of fibers/yarns can be heat set.

Materials Required: Polyester yarn or sewing thread (approx. 12 inches)
Cotton yarn or sewing thread (approx. 12 inches)
Aluminum foil or disposable pie tin
Two straight pins or straightened paper clips
Oven preheated to 300° F.
Warm, soapy water (laundry or dish detergent OK)
Paper towels
Tape

Procedures:

1. Wind the polyester yarn in a coil around a straight pin or straightened paper clip. Repeat using the cotton yarn.
2. Place the coiled yarns onto the aluminum foil or disposable pie tin and place in 300° F oven.
3. Bake for 20 minutes to “heat set,” carefully remove from oven, and let cool for 5 minutes.
4. Complete the answer sheet.

LAB 3: Answer Sheet

Name: _____

1. Unwind the two yarns and describe their appearance:

Polyester: _____

Cotton: _____

2. Tightly extend both yarns to their fullest length possible and hold for about 30 seconds; release. Describe the results.

Polyester: _____

Cotton: _____

3. Place both yarns in warm, soapy water for approximately 30 seconds; agitate to simulate machine laundering; rinse and blot dry with a paper towel. Using tape, mount the yarns below and describe the results.



Polyester



Cotton

Results: _____

LAB 3: Answer Sheet (continued)

4. Explain why the polyester and cotton yarns behaved as they did in Steps 2 and 3, using the fiber properties of polyester and cotton to justify your answer.

5. Yarns made from other thermoplastic fibers would react to heat setting in much the same manner as the polyester yarn did. Yarns made from other non-thermoplastic fibers would react to heat setting in much the same manner as the cotton yarn did. Indicate whether yarns made from each fiber listed below would behave more like polyester or more like cotton in reaction to heat.

Yarn made from:

Reaction to heat (circle the correct answer):

nylon	more like:	cotton	polyester
silk	more like:	cotton	polyester
rayon	more like:	cotton	polyester
acrylic	more like:	cotton	polyester
wool	more like:	cotton	polyester
flax	more like:	cotton	polyester
acetate	more like:	cotton	polyester
olefin	more like:	cotton	polyester
spandex	more like:	cotton	polyester

LAB 4: Three Basic Weave Structures

Name: _____

Objective: To understand the three basic weave structures and their characteristics.

Rationale: All woven fabrics are derived from one of three basic weave structures. The weave structure affects many of the performance characteristics of the fabric. Therefore, a better understanding of the weave structures leads to an increased ability to predict fabric performance.

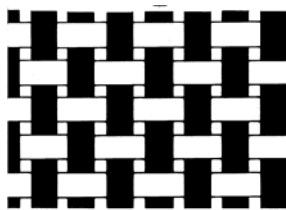
Introduction: In this lab, students will use paper strips to simulate yarns as they weave a sample of each of the three main weave structures. Then they will use their woven samples to answer general questions about each of the three main weave structures and the impact of weave structure on fabric performance.

Materials Required: 2 contrasting colors of paper, 8 1/2 x 11" (3 sheets of each color)*
Tape
Textbook

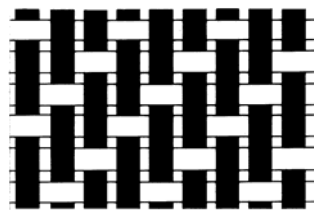
NOTE: Some instructors may allow students to use materials other than paper to complete this assignment. For example, knitting yarns, rubberband strips, fabric strips, and other creative materials may be used for weaving the samples.

Procedures:

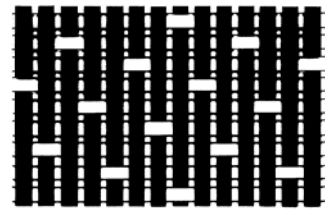
1. Cut each sheet of paper into narrow strips (make your darker paper the warp and use a white paper for the filling). To make this easy, the templates on the following pages may be photocopied onto the paper before cutting. Also, some paper shredders work well for quickly creating uniform paper "yarns" without the use of templates.
2. Tape a set of dark/warp "yarns" together across the top edge.
3. Weave the following three samples, using information from your textbook and the following illustrations as a guide:



Plain Weave
(alternating over and under)



2/1 Twill Weave
(under 2, over 1, progress 1)



7/1 Satin Weave
(under 7, over 1, progress 2)

Weave a set of white/filling "yarns" into the dark/warp "yarns" according to the diagrams above and referring to information about each basic weave type in your textbook. Tape across the bottom edge of each sample when finished. You may also wish to tape the side edges, or "selvages."

4. Use your weave samples to help you answer your Study and Review Questions in SRQ 4.
5. Write your name on each weave sample and staple them to this sheet.

W A R P

LAB 5: Colorfastness to Light

Objective: To observe the varying lightfastness, or colorfastness to light, of different fabrics.

Rationale: Lightfastness is an important property of fabrics intended for certain end use products, for example, home furnishings, particularly window treatments and other items that will receive heavy exposure to sunlight or artificial light.

Introduction: In this lab, you will achieve an approximate, comparative analysis of the lightfastness of different fabrics. Professional textile testing labs usually test lightfastness using weatherometers or other equipment that simulate exposure to different types of light under carefully controlled conditions (see AATCC Method 16 for details).

Materials Required: Fabric (2" x 3" or larger if available)

Tape

Window (sunny, south-facing window is preferable)

NOTE: Using additional samples of the same fabric, you may repeat this test under various conditions (for example, north-facing window, fluorescent lighting, incandescent lighting) to simulate colorfastness to varying degrees and types of light, which is important for different end uses).

Procedures:

1. Using pen or pencil and ruler, mark off six equal columns on the back or wrong side of your fabric sample and label each column as samples 1-6.

1	2	3	4	5	6
---	---	---	---	---	---

2. Cut off sample 1 and mount it as a control sample (away from sunlight) on your answer sheet.
3. Tape the remaining fabric on a sunny window with the face or right side of the fabric on the glass (facing the outside).
4. After the following times, cut off the test samples as follows and mount each sample on your answer sheet.

Sample 2	4 days
Sample 3	8 days
Sample 4	16 days
Sample 5	32 days
Sample 6	64 days
5. Compare each test sample to your control sample and rate it according to the following scale:

1.0 = Significant change
2.0 = Moderate change
3.0 = Noticeable change
4.0 = Slight change
5.0 = No change or negligible change
6. Complete the answer sheet.

LAB 5: Answer Sheet

Name: _____

Mounted in window facing: _____ (direction)

Date started:	Mount Sample 1 Control here:	Color change rating scale: 1 = Significant change 2 = Moderate change 3 = Noticeable change 4 = Slight change 5 = No change or negligible change
Date after 4 days:	Mount Sample 2 here:	Rating and comments:
Date after 8 days:	Mount Sample 3 here:	Rating and comments:
Date after 16 days:	Mount Sample 4 here:	Rating and comments:
Date after 32 days:	Mount Sample 5 here:	Rating and comments:
Date after 64 days:	Mount Sample 6 here:	Rating and comments:

LAB 6: Colorfastness to Crocking

Objective: To demonstrate whether or not a fabric will transfer color when rubbed against another fabric.

Rationale: It is important to identify fabrics with poor colorfastness to crocking. Products made from such fabrics will cause problems for consumers in use. For example, dye from a jacket fabric may rub off on the fabric of the shirt worn beneath it. Fabrics with a tendency to crock may transfer dye not only to other fabrics but to other surfaces, such as the wall behind a sofa, or the skin beneath a pair of jeans. Crocking is usually measured both dry, to predict color transfer problems that may occur during ordinary use, and wet, to predict color transfer problems that may occur when fabrics get damp or wet, for example, when swimsuits are worn while wet and sitting on furniture.

Introduction: Crocking is usually determined in a laboratory using a standard test method and a machine called a “crockmeter” which repeatedly rubs the surface of the fabric with a mechanical finger covered in white fabric. The amount of color transferred from the test fabric to the white fabric is evaluated as a measure of colorfastness to crocking. In this lab exercise, you will simulate this test by manually rubbing a test specimen.

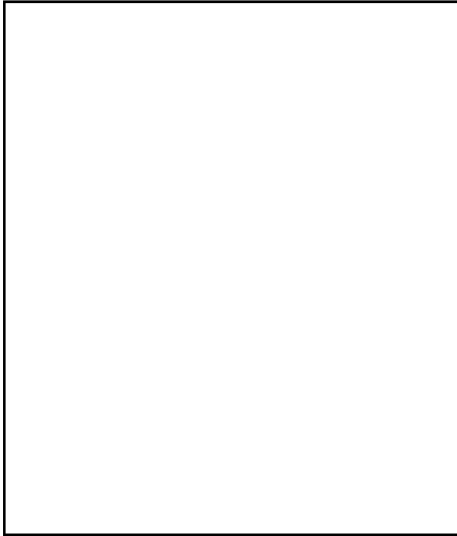
Materials Required: Test sample of solid colored fabric (preferably at least 3” x 10”)
 2 samples of white 100% cotton muslin fabric, each at least 2” x 2”
 Pencil with eraser or ink pen with flat end
 Rubber band or string
 Water
 Paper towels

Procedures:

1. Place a sample of solid colored fabric on a flat desktop or tabletop.
2. Place a piece of white fabric over the eraser end of a pencil or flat end of an ink pen and secure with a rubber band or string.
3. Rub the white fabric across the face of the colored fabric 10 times, using moderate pressure (about what you would use to erase a pencil mark on a piece of paper). Each rubbing should be back and forth and preferably cover about 6 inches of length (if test samples are smaller, rub more times to compensate).
4. Remove the white fabric and lay it out flat on the desktop or tabletop. Examine it to see how much, if any, color transferred onto it from the colored fabric. Use the following scale to evaluate colorfastness to dry crocking:
 - 1.0 = Significant change**
 - 2.0 = Moderate change**
 - 3.0 = Noticeable change**
 - 4.0 = Slight change**
 - 5.0 = No change or negligible change**
5. Repeat the above test, but first wet the white fabric sample and blot it with a paper towel to absorb excess moisture (it should be damp, not dripping wet). This will determine the colored fabric’s colorfastness to wet crocking. Be sure to rub in a different area on the colored fabric.
6. Complete the answer sheet.

LAB 6: Answer Sheet

Name: _____



Fabric name: _____

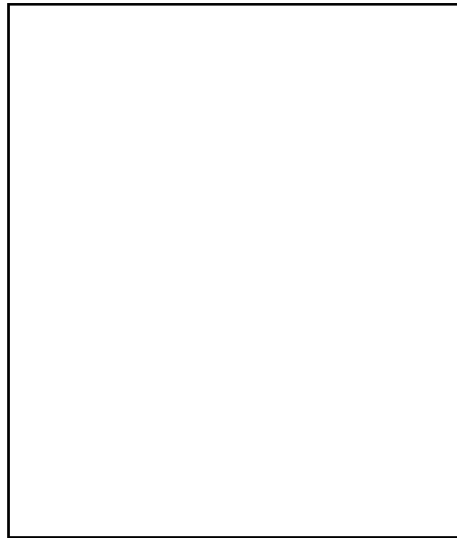
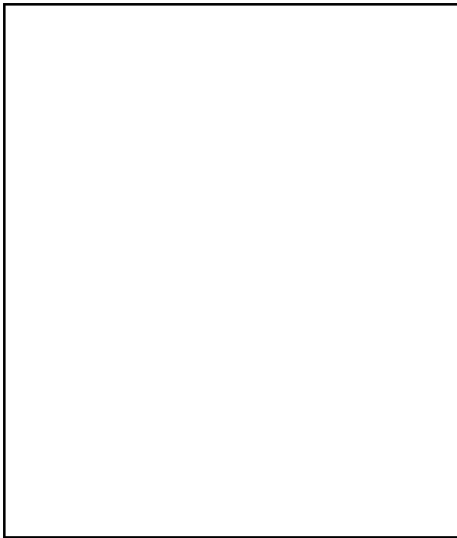
Fiber content: _____

Stage of dyeing (if known): _____

Printed (yes or no): _____

Main color/s (hue/value/intensity):

Sample of fabric tested



White fabric from **dry** crocking test

Colorfastness rating: _____

White fabric from **wet** crocking test

Colorfastness rating: _____

LAB 6: Answer Sheet (continued)

2. Compare your results to those of other students in your class. What fiber types exhibited the least resistance to crocking?

3. What colors (hues/values/intensities) exhibited the least resistance to crocking?

4. Identify 3 product categories where evaluating fabric for colorfastness to crocking is important.

5. In addition to colorfastness to light and colorfastness to crocking, what other measures of colorfastness are important, particularly for apparel fabrics?
