

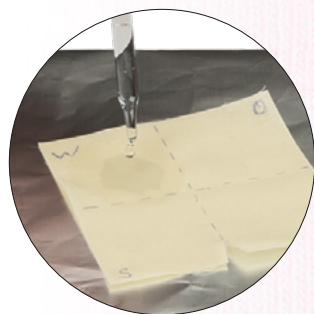


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Volume 48 | Gr. 9-12

Time: 6-8 class periods (45 minutes each)

## Textiles testing – part 2



### Standards

#### NASAFACS

**16.2** Evaluate textiles, fashion, and apparel products and materials and their use in diverse settings.

**16.2.1** Apply appropriate terminology for identifying, comparing, and analyzing the most common generic textile fibers and fabrics.

**16.2.2** Evaluate performance characteristics of textile fiber and fabrics.

**16.2.3** Analyze textile legislation, standards, and labeling in the global economy.

**16.2.4** Analyze characteristics of textile components in the design, construction, care, use, maintenance, and disposal or recycling of products.

**16.2.5** Evaluate fiber and textile products and materials competencies

### Materials list:

- Nasco Fiber Testing Kit ([WA35039](#))
- Fabric scissors ([WA32778](#)) or ([9728984](#))
- Pens ([9734597](#)) or ([9731311](#))
- Pencils ([9742149](#))
- Permanent markers [[9717997\(A\)](#)]
- Fabric markers ([9735273](#))
- Aluminum foil ([W09460](#))
- Sewing pins ([W05440](#)) or ([WA05861](#))
- Stapler ([TB20635](#)), fabric glue ([9726500](#)), or tape ([9740908](#))
- Tweezers ([C34393](#))
- Timer ([WA33948](#)) or ([WA25085](#))
- Eyedropper or pipettes ([SA01161](#))
- Plastic wrap ([W09464](#))
- Gloves ([SB48877](#)) or ([WA32309](#))
- Masking tape ([9701126](#))
- Safety goggles ([SB46929](#))
- Glass dishes or disposable aluminum pans [[K01054\(S\)](#)]
- Iron ([WA31927](#))
- Ironing surface ([NE40310](#))
- Glue gun ([9731443](#))
- Paper towels
- Olive oil or vegetable oil
- Red food coloring
- Caramel-colored soda (not diet)
- Vinegar
- 100% acetone nail polish remover
- Bleach (with at least 5.5% sodium hypochlorite)
- Unscented tea candle
- Lighter or matches
- 3 glass containers

## Introduction

- Explain the overview of the project to students
- See discussion questions in Appendix 1 (p. 3)

## Formative assessment (20–30 minutes)

*Formative assessment teacher guidelines includes materials list and directions (p. 13)*

- Weave a roving yarn that is bulky and plush. Have the students manipulate the yarn into a design of their choice using knots and ties. They may add other types of fabric with a glue gun or tie in other pieces of fabric. They may use water to warp the fabric. In addition, they may use permanent markers to color them and then water to dilute the yarn. Be creative! Allowing students to self-design will influence a greater discussion later.
- Have students number their design with a designated number given to each student by the teacher.
- Have students display their woven masterpieces to create a gallery-like setting.
- Allow students a few minutes to walk about and look at each piece. They may feel the pieces, but they may not move or adjust them.
- See discussion questions in Appendix 1 (p. 3).



## Activity 1 (20–30 minutes)

Show examples of generic and natural fibers. Talk about the differences and have students record their observations. (Appendices 2–4, pp. 4–6)

## Activity 2 (20–30 minutes per fabric test)

Please refer to the Nasco Fiber Testing Kit ([WA35039](#)) and complete topics below.

### Control sample and appearance tests

- Follow project 1 worksheet provided in kit to record results.
- Materials needed: fabric swatches provided in kit, scissors, ruler, stapler, at least 27 sewing pins, and pen or pencil.
- Discussion questions (Appendix 5, p. 7)

### Strength test

- Follow projects 2, 3, and 4 worksheets provided in kit to record results.
- Materials needed: ink pen, scissors, container or water, paper towels, and ruler.
- Discussion questions (Appendix 5, p. 7).

### Absorption test

- Follow projects 2, 3, and 4 worksheets provided in kit to record results.
- Materials needed: aluminum foil, clock with a second hand, container of water, eyedropper, and paper towels.
- Discussion questions (Appendix 6, p. 8).

### Stain resistance test

- Follow projects 2, 3, and 4 worksheets provided in kit to record results.
- Materials needed: aluminum foil, container of water, olive or vegetable oil, eyedropper, iron, plastic wrap, paper towels, red food coloring, caramel-colored soda (not diet), Styrofoam cup, vinegar, orange juice, lipstick, chocolate (rubbed in), suntan lotion, and grass stains.
- Discussion questions (Appendix 7, p. 9, two charts available).

### Heat resistance test

- Follow projects 5 and 6 worksheet provided in kit to record results.
- Materials needed: iron, aluminum foil, clock or timer, and safe ironing surface.
- Discussion questions (Appendix 8, p. 10).

### Thermoplasticity test

- Follow projects 5 and 6 worksheet provided in kit to record results.
- Materials needed: iron, container of water, timer, and paper towels.
- Discussion questions (Appendix 8, p. 10).

### Solubility test

- Follow project 7 worksheet provided in kit to record results.
- Materials needed: two glass containers, paper towels, rubber gloves, 100% acetone nail polish remover, masking tape, clock or timer, safety goggles, and bleach with at least 5.5% sodium hypochlorite (general brands have this).
- Discussion questions (Appendices 8–9, pp. 10–11).

### Burn test

- Follow project 8 worksheet provided in kit to record results.
- Materials needed: unscented tea candles, container of water, glass dish, disposable aluminum pan or aluminum foil, lighter or matches, and sewing pin.
- Discussion questions (Appendix 9, p. 11).

## Mystery fabric conclusion (5–10 minutes)

- Reference project 1–8 worksheets provided in kit to answer discussion questions.
- Discussion questions (Appendix 10, p. 12).

## After lesson classroom-to-community connections

- Review the questions asked on formative assessment sheet again.
- Discussion questions (Appendix 10, p. 12).

**For organization and better student understanding, discussion questions may be printed, attached, and answered on the back of each testing sheet.**

## Introduction

**Teacher directions:** Ask the following questions to introduce textiles testing to the students.

Why do you think we are going to test the fabric?
---

What purpose in your life and the lives of others do you think this lab has?
--

What do you anticipate we will be doing next?
---

## Formative assessment

**Teacher directions:** Using constructive critique, ask the following questions. Students should use descriptive answers.

Which piece catches your eye? Why?
------------------------------------

Which piece had the best hand? Explain what “hand” means in textiles.
---

Which creation was hydrophilic or hydrophobic? Explain what “hydrophilic and hydrophobic fibers” means in textiles
--

Did any creation have luster? Explain what “luster” means in textiles.
--

Did you feel that any creation was stain repellent or stain resistant? Explain what “stain repellent” and “stain resistant” means in textiles.
--

What do you think your creations have to do with textiles and fabric testing?
---

# Appendix 2

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Activity 1

**Directions:** Fill out the table below with the appropriate information given by the teacher. When completing, make sure to write a description that will help you remember. You do not need to write the exact definition. Hand refers to the touch. Please include what you feel when you pick up the fabric. Lastly, complete a drawing, print out a small picture, or prepare a swatch of fabric for the last part of the table shown below.

### Classifications of generic fibers:

Name: Cellulose

Description	Hand	Picture or swatch

Name: Protein

Description	Hand	Picture or swatch

Name: Synthetic

Description	Hand	Picture or swatch

Name: Mineral

Description	Hand	Picture or swatch

# Appendix 3

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Classifications of natural fibers:

Name: Cotton

Description	Hand	Picture or swatch

Name: Linen

Description	Hand	Picture or swatch

Name: Silk

Description	Hand	Picture or swatch

Name: Wool

Description	Hand	Picture or swatch

# Appendix 4

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Classifications of manufactured fibers:

### Name: Synthetic

Type: Acrylic

Description	Hand	Picture or swatch

Name: Polyester

Description	Hand	Picture or swatch

### Name: Regenerated

Sub-type: Acetate

Description	Hand	Picture or swatch

Sub-type: Rayon

Description	Hand	Picture or swatch

# Appendix 5

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Activity 2: Summative discussion questions for each test

### Control sample and appearance test:

Questions	Answers
What general statement can you make about the resiliency (crease recovery) of natural fibers? What about synthetic fibers?	
Which fabrics would you use in a wedding dress? Why?	
What types of clothing could be made from each of the fabrics? Home furnishings? Other uses?	
Which fabrics would drape the best for a circular skirt?	

### Strength test:

Questions	Answers
Which fabrics were easier to tear when dry?	
Did any of the fabrics become easier to tear once they were wet?	
Did any of the fabrics become harder to tear once they were wet?	
How might the results of the strength test affect the care or cleaning of a garment made with the same fiber?	

# Appendix 6

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Absorption test:

Questions	Answers
Which fabrics absorbed the water into the fibers of the fabric (hydrophilic)?	
Which fabrics demonstrated wicking?	
Which fabric allowed the water to spread over the largest area?	
Which characteristic – hydrophilic or hydrophobic – would make a fabric dry faster?	
Which characteristic – hydrophilic or hydrophobic – would you want in your shirt on a hot day?	
Absorbency is also a key factor in static electricity, since moisture will conduct or bleed electrical charges away. Which of your swatches would be least likely to have static electricity? Which of your swatches would have the most static electricity?	
Why is the amount of water absorbed by a fabric important?	



# Appendix 7

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Stain resistance test:

Questions <b>after</b> steps #1–16	Answers
Which fabric swatches had the worst soda (sugar-based) stains? What characteristic did these fabrics have in common?	
Which fabric swatches had the worst dye stains? What characteristic did these fabrics have in common?	
Which fabric absorbed the oil stain and did not release it (oleophilic)? Why might this happen?	
What effect did ironing the samples have on the ability to rinse the stains out? Did the stain wash out the same or differently than the air-dried samples?	
The ink pen used to mark the squares is an additional stain; did any of the ink stains rinse out with the warm water?	

Questions <b>after</b> steps #18–21	Answers
Did the vinegar rinse have any effect on the soda (sugar-based) stains? Oil stains? Dye stains? Ink stains?	
Did the air-dried stains react differently than the iron-dried stains in the vinegar rinse?	
How will the outcomes of this test assist you in the laundry care of your clothing?	
Fabrics that are more absorbent may take stains and dyes more easily. Did you observe these results?	

# Appendix 8

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Heat resistance test:

Questions	Answers
Which fibers were most affected by heat?	
How might the results of this test influence the way you launder, dry, or iron your own clothing?	

## Thermoplasticity test:

Questions	Answers
Which fabric was thermoplastic?	
Layering the polyester sample flat, does one side of the folded rectangle look shinier than the other? Where the iron touched the polyester on the one side of the fold would have flattened the fibers, making them appear shinier. The other side touching the ironing board would remain unaffected.	

## Solubility test:

Questions <b>after</b> steps #1–16 (part #1)	Answers
Which fibers did the bleach affect, by either dissolving or becoming mushy?	
What fiber classification do these fibers have in common?	
Which fabric's colors were affected or changed by immersion in the bleach?	
What is chlorine bleach used for?	
Would you use bleach on all fibers? Why or why not?	

# Appendix 9

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Questions <b>after</b> steps #1-7 (part #2)	Answers
Which fibers were most affected by the acetone solution?	
Why do you think the acetone would affect the fibers in this manner?	
Name one common use for acetone.	

## Burn test:

Questions	Answers
What are the differences between the way the natural fibers and the synthetic fibers burned?	
What are the similarities between the natural fibers and synthetic fibers?	
Thermoplasticity is a process where the fibers become soft and eventually melt when heated. Which fibers exhibited this characteristic? Did this match the thermoplasticity test?	
Why do you think the burn test cannot be used as the sole test to identify a fabric?	
If you are having a barbecue with an open flame, should you wear lightweight, loose fitting clothing or a more fitted, medium-weight garment? Why?	

# Appendix 10

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Mystery fabric:

Question

Answer

Be prepared to discuss the results of each of the fiber tests to support their conclusions of the fiber content of the mystery fabric.

## After lesson classroom-to-community connection

Now that you have completed the fabric test, why do you think we tested different types of fabrics?

What purpose in your life and the lives of others do you think this lab has?

## What is roving yarn?

The top of spinning fiber that is processed from wool, but not yet spun into a yarn.

## Materials needed

- Roving yarn fiber samples (this will help reduce costs — 4 full sample rolls of various colors — Bernat roving is a good example of a cost-effective yarn)
- Permanent markers in different colors
- Fabric markers
- Glue gun with extra glue sticks
- Paper or plastic cup for water
- Embellishments (if desired)

## Teacher directions

1. Each student will receive at least 4' of roving yarn. Make sure each student picks up at least four different colors of yarn to equal 4'.
2. Allow students to make loops and knots from the yarn.
3. Students may then color the yarn with permanent or fabric markers.
4. A glue gun may be used to add embellishments, if desired.
5. Students may use hot and cold water and/or stretch or compress the yarn as well.
6. Once done (should take 20–30 minutes), display the pieces of artwork. Each artwork should have a designated number by it that is assigned by the teacher.
7. At this time, begin your constructive critique. For discussion questions, see Appendix 1 (p. 3).