How Are Metal and Fabric Combined to Make Useful Everyday Items?

We will compare and contrast these two materials and find out how they are often combined.

Materials

Chenille sticks in various colors (green for stems), craft sticks, felt or construction paper, fabric scraps, scissors, glue.

A more detailed list can be found on Page 2.

Standards

NCECDTL, ELOF: Goal IT-ALT 3, 4, 5, 6, 7, 8, 9; Goal P-ATL 6, 7, 8, 9, 10, 11, 12, 13; Goal P-LC 1, 2, 3, 4, 5, 6, 7; Goal P-LIT 4, 5; Goal IT-C 1, 2, 3, 5, 6, 7, 9, 10, 12, Goal P-MATH 7, 8, 10; Goal P-SCI 1, 2, 4, 5, 6; Goal IT-PMP 1, 2, 3, 4, 5, 6, 7, 8; Goal P-PMP 2, 3; MI Standards SS 1, 3.

Model I Innovation Learning Framework

Throughout this lesson, there will be opportunities to bring in Model I’s Habits of an Innovator and Actions of Innovation.

More information on Model I can be found at: thf.org/education/teaching-innovation/modeli

Lesson Overview

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<th>ELA/LIT</th>
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<tr>
<td>Explore</td>
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<tr>
<td>Ask what characteristics students remember about the materials.</td>
<td>Explore the classroom for objects that combine metal and fabric.</td>
<td>Make flowers with cloth or felt petals and chenille sticks.</td>
<td>Read stories related to the learning: The Most Magnificent Thing by Ashley Spires and Rosie Revere, Engineer by Andrea Beaty.</td>
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<tr>
<td>Ask why some things can be made with metal but not fabric and vice versa.</td>
<td>Discuss many uses for metal and fabric in the collections of The Henry Ford: crinoline, dress, tomato harvesting, automobiles.</td>
<td>Make spider webs and spiders with chenille sticks and yarn.</td>
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<td>Discus</td>
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<td>Make yarn monsters with yarn and chenille sticks.</td>
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Stay Curious, Collaborate, Uncover

Design, Learn from Failure

Be Empathetic, Be Empathetic

Stay Curious, Collaborate
Let’s Learn About
METAL & FABRIC

Materials

Explore
Activity — Touch Exploration
• Teachers can provide as many examples of metal and fabric items as possible for touch exploration, such as scraps of fabric and pieces of metal, including hard metal (like iron) and soft metal (aluminum), for students to compare and talk about the characteristics of each.

Discover
Activity — What Around Our Classroom Is Made of Metal and Fabric?
• Fabric lampshades, umbrella, tennis shoes, flag with metal rivets, purses, sleeping bag, medals, jackets, jeans, lanyard, etc.

Create
Project Two — Chenille Stick Flowers
• Green chenille sticks
• Various color chenille sticks, longest available
• Small pompons for flower centers (optional)

Create
Project Three — Woven Yarn Spider Web
• 6 or 7 black chenille sticks
• Yarn

Create
Project One — Fabric Flowers
• 7 craft sticks (may be narrow or wide)
• Sheet of felt for background (may use sheet of construction paper)
• Fabric scraps
• Green chenille sticks
• Scissors
• Glue

Create
Project Four — Yarn Monsters
• Yarn
• Chenille stick
• Googly eyes
• Scissors
• Glue
Let’s Learn About
METAL & FABRIC
Lesson Guide

Explore
Stay Curious, Collaborate, Uncover
Compare, Contrast, Combine
How Versatile Are
Metal and Fabric? ............... Page 4
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Links & Photos ..................... Pages 5-12

Discover
Stay Curious, Uncover
Activities: What Around Our Classroom
Is Made of Metal and Fabric? .... Page 13

Artifact of the Day
Stay Curious, Be Empathetic
George Washington’s
Camp Bed ............................. Page 14
Links & Photos ....................... Pages 15-16

Create
Design, Learn from Failure
What Can We Make with
Metal and Fabric?
Project 1: Fabric Flowers ............ Page 17
Project 2: Chenille
Stick Flowers ................. Page 18
Project 3: Woven Yarn
Spider Webs .................. Page 19
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Inspiring Stories
Be Empathetic, Learn from Failure
Read Stories to Inspire
Your Students ....................... Page 21

Review & Extend
Stay Curious, Collaborate
Ask Students Specific and
Open-Ended Questions .......... Page 22
Family Connection .................. Page 23
Coloring Sheet ....................... Page 24
Let’s Learn About
METAL & FABRIC

Explore

Compare, Contrast, Combine
Teachers can ask students how metal and fabrics are used. Students should remember the many ways they have seen metal used alone and with other materials. Same for fabric. Students should be able to compare those item lists.

Ask students why certain items made with metal could not be made with fabric and why certain items made with fabric could not be made with metal. (Contrast the properties of metal and fabric.)

Students can discover what happens when you combine the two materials by exploring the items in The Henry Ford’s collection listed below.

What Can Be Made with Metal and Fabric?

Clothing
Teachers can ask students what they might know or have seen about women’s dresses from long ago and show the image of the crinoline, explaining how this held a woman’s dress up and out. Related image of the crinoline in action is also included to illustrate. Students can imagine what dressing like that was like. What might you not be able to do?

Agriculture
Teachers can show image of workers harvesting tomatoes by hand at a Heinz tomato farm in 1908 and ask what students think of picking tomatoes from those low plants in such a large field. Students may grow tomatoes at home or have picked them. Ask them to imagine picking by hand all the tomatoes they might see in the produce department of the grocery store, then think of all the stores with tomatoes and how a machine to pick would be so helpful. Teachers can show image of the tomato harvester.

Transportation
Teachers can also show pictures of unique convertible automobiles and something students may be familiar with — seat belts. Students may have ridden in a convertible, but all should be able to imagine the feeling of riding in one.

Activity

Touch Exploration
Provide examples of different metal and fabric objects for touch exploration, such as scraps of fabric and pieces of metal, including hard metal (like iron) and soft metal (aluminum), for students to compare and talk about the characteristics of each.

Links and photos for this section are on Pages 5-12.

Model i Innovation Learning Framework

Stay Curious, Collaborate, Uncover
- Ask questions like what, why, how.
- Talk about helping, working together.
- What do you see (characteristics, properties)? What problems do these materials help us solve?
Let’s Learn About
METAL & FABRIC

Explore — Links

Crinoline Cage, circa 1880

thf.org/collections-and-research/digital-collections/artifact/119974
Let’s Learn About
METAL & FABRIC

Explore — Links

Dress with Crinoline Cage, circa 1856
thf.org/collections-and-research/digital-collections/artifact/388039
Let’s Learn About
METAL & FABRIC

Explore — Links

Workers Harvesting Tomatoes by Hand at a Heinz Tomato Farm in 1908

thf.org/collections-and-research/digital-collections/artifact/63625
Let’s Learn About
METAL & FABRIC

FMC Tomato Harvester, 1969
thf.org/collections-and-research/digital-collections/artifact/159896
Let’s Learn About
METAL & FABRIC

Explore — Links

Duesenberg Model J Convertible, 1931
thf.org/collections-and-research/digital-collections/artifact/187767
Let’s Learn About
METAL & FABRIC

Ford DeLuxe Convertible, 1939

thf.org/collections-and-research/digital-collections/artifact/94608
Let’s Learn About
METAL & FABRIC

Mercury Customized Convertible, 1949
thf.org/collections-and-research/digital-collections/artifact/5652
Let’s Learn About
METAL & FABRIC

Automobile Seat Belt, 1964

thf.org/collections-and-research/digital-collections/artifact/175007
Activity
What Around Our Classroom Is Made of Metal and Fabric?

Students can continue discovering what happens when you combine the two materials by exploring for items around the classroom.

Teachers can be sure to provide items for students to find such as fabric lampshades, umbrella, tennis shoes with metal eyelets, flag with metal rivets, purses, sleeping bag, medals, jackets, jeans, lanyard, etc.

Model i Innovation Learning Framework
Stay Curious, Uncover

• Ask questions like what, why, how.
• What do you see (characteristics, properties)? What problems do these materials help us solve?
Let’s Learn About
METAL & FABRIC
Artifact of the Day

What Is George Washington's Camp Bed?
Teachers show pictures of George Washington's Camp Bed. George Washington spent many nights sleeping inside a fabric tent on a specially designed camping bed. Check out this special piece made of metal and fabric, and think about why metal and fabric were used to make this a necessary part of Washington’s overnight gear. Ask students if they've been camping. What would be difficult/different about using this bed?

Additional Presentation
Teachers can invite a guest with a cloth-top convertible car that would be willing to show students how it operates.

Model i Innovation Learning Framework
Stay Curious, Be Empathetic
- Ask questions like what, why, how.
- How did the characters in the stories feel? How might the stories make others feel?

Links and photos for this section are on Pages 15-16.
Let’s Learn About METAL & FABRIC

Artifact of the Day — Links

George Washington’s Camp Bed, 1775-1780

thf.org/collections-and-research/digital-collections/artifact/35533#slide=gs-183210
Let’s Learn About
METAL & FABRIC

Artifact of the Day — Links

George Washington’s Camp Bed, 1775-1780

thf.org/collections-and-research/digital-collections/artifact/35533#slide=gs-183207
Let’s Learn About
METAL & FABRIC

Create — What Can We Make with Metal and Fabric?

**Project 1: Fabric Flowers**

**Materials**
- 7 craft sticks (may be narrow or wide)
- Sheet of felt for background (may use sheet of construction paper)
- Fabric scraps
- Green chenille sticks
- Scissors
- Glue

**Instructions**
1. Make the picket fence by placing 5 craft sticks in a row. Dab glue on each stick approximately ½ inch from the top and 1 inch from the bottom. Place the 2 crossbeams on the glue and allow to dry.
2. Glue the picket fence to the felt sheet (or construction paper)
3. Cut green chenille sticks to desired lengths and glue to picket fence.
4. Cut 2-inch circles or flower shapes of fabric for flower heads and glue on green stems.

**Model i Innovation Learning Framework**

**Design, Learn from Failure**
- Make, build and create.
- Talk about “trying again,” what’s another way to...
Let’s Learn About
METAL & FABRIC
Create — What Can We Make with Metal and Fabric?

Project 2: Chenille Stick Flowers

Materials

• Green chenille sticks
• Various color chenille sticks, longest available
• Small pompons for flower centers (optional)

Instructions

1. Bend colored chenille stick into loops for flower petals.
2. Twist ends together at center of loops.
3. Attach green chenille stick at center by twisting end around the center.
4. Fold and twist opposite end of green chenille to make a thicker stem.
5. Small pompon may be glued at center of flower petals.

Model i Innovation
Learning Framework

Design, Learn from Failure

• Make, build and create.
• Talk about “trying again,” what’s another way to...

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Let’s Learn About
METAL & FABRIC

Create — What Can We Make with Metal and Fabric?

Project 3: Woven Yarn Spider Web

Materials

• 6 or 7 black chenille sticks
• Yarn

Instructions

1. Twist 4 chenille sticks together at the center to make the frame of the web.
2. Wrap yarn around each arm, alternating over and under. Tie off end of yarn to one arm.
3. Cut 2 chenille sticks in half for spider legs.
4. Wrap remaining chenille stick around the center of the four legs and bend to form spider legs.
5. Attach spider to web and hang.

Model i Innovation Learning Framework

Design, Learn from Failure

• Make, build and create.
• Talk about “trying again,” what’s another way to...

thf.org/innovationlearning
Let’s Learn About METAL & FABRIC
Create — What Can We Make with Metal and Fabric?

Project 4: Yarn Monsters

Materials
- Yarn
- Chenille stick
- Googly eyes
- Scissors
- Glue

Instructions
1. Fold chenille stick in half.
2. Twist each half around the other half once, about 1/3 of the distance from the ends, creating a loop.
3. Wrap yarn around 2-3 fingers of an adult hand or 4-5 fingers of tot to create a thick wedge of yarn.
4. Slip yarn wedge off fingers and wrap chenille stick around center of wedge, slipping ends of stick through loop created where folded. Pull chenille stick tight.
5. Cut loops on each end of wedge of yarn.
6. Curl ends of chenille stick in opposite directions to create eye sockets.
7. Glue googly eyes to sockets.

Model i Innovation Learning Framework

Design, Learn from Failure
- Make, build and create.
- Talk about “trying again,” what’s another way to...

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Let’s Learn About
METAL & FABRIC
Innovation Learning

Read Stories to Inspire Your Students

Rosie Revere, Engineer
by Andrea Beaty

The Most Magnificent Thing
by Ashley Spires

Model i Innovation Learning Framework

Be Empathetic, Learn from Failure

• How did the characters in the stories feel? How might the stories make others feel?
• Talk about “trying again,” what’s another way to...
Let’s Learn About METAL & FABRIC

Review & Extend

Ask Students Specific and Open-Ended Questions

- What was the best part of the story?
- What other things do you think are made with metal and fabric?
- What (other) jobs do people do that they might use metal and fabric?

Family Connection

Send the worksheet on Page 23 home with students to be completed at the end of the lesson.

Coloring Sheet

Have students color the picture on Page 24 as a part of the lesson, or send it home to be colored.

Model i Innovation Learning Framework

Stay Curious, Collaborate

- Ask questions like what, why, how.
- Talk about helping, working together.
Take the Learning Home

We are learning about **metal and fabric** and the way it is used in many items we use every day.

Please take your student on an "I Spy" **adventure** through your home, and maybe your neighborhood, to see what items or structures are made with metal and fabric. What are some of these things?

Have them draw what they find.

These are some of the stories related to our learning. You might enjoy reading them with your student.

- **Ella’s Umbrellas** by Jennifer Lloyd
- **The Big Umbrella** by Amy June Bates
- **The Persistent Owl** by Efrat Haddi
Let’s Learn About
METAL & FABRIC

George Washington’s Camp Bed, 1775-1780