Let’s Learn About
NATURAL MATERIALS

Quick View

How Do We Use Natural Materials in Products We Use Every Day?

Explore natural materials that we grow, gather and use to make and decorate useful objects. Materials that come from fields, forests, birds and insects have always provided people with materials we can use to help us work and play.

Materials

Cotton, wool, straw, jute, silk, nuts, berries, spices, paper, paintbrushes, water, leaves, flower petals, paper, tape, cotton balls, google eyes, glue, various hats made of natural materials.

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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<tr>
<td>Explain that things that come from plants, animals or the ground are natural materials. Show the use of natural materials at Daggett Farmhouse and Mrs. Cohen’s Millinery. Provide many examples of natural materials for touch exploration.</td>
<td>Think of ways natural materials might be used. Have students do some classroom chores using natural materials. Have students imagine other ways they might use natural materials.</td>
<td>Make a crown of natural materials. Make paint from natural materials and have students paint a picture. Dress a figure or create a picture with natural materials.</td>
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Stay Curious, Collaborate, Be Empathetic

Stay Curious, Collaborate, Be Empathetic

Stay Curious, Uncover

Design

Stay Curious, Learn from Failure

Stay Curious, Collaborate
Let’s Learn About
NATURAL MATERIALS

Explore
Activity: Touch Exploration
• Bamboo
• Clay
• Cotton
• Rock
• Wood

Discover
Activity
• Straw broom
• Natural sponge
• Wicker basket/wooden bucket

Create
Project 1: Make A Crown
• Brown paper bags (grocery bags are sturdier; lunch bags can work)
• Duct tape
• Scissors
• Leaves, flowers, sticks, grasses and other natural materials

Create
Project 2: Painting
• Egg yolks (to bind paint pigment)
• Distilled vinegar
• Water
• Paintbrushes
• Paper
• Pink/Purple/Red — Berries, cherries, beets, roses, hibiscus, basil leaves, pomegranates
• Blue — Blueberries, purple grapes, indigo, red cabbage, elderberries
• Grey/Black — Wood ash, charcoal
• White — Chalk, talcum powder
• Yellow — Onion skins, turmeric, sunflower petals, bay leaves, dandelion flowers, marigolds, celery leaves
• Green — Artichokes, spinach, peppermint leaves, lilacs, grass
• Orange — Chili powder, paprika, carrots

Create
Project 3: Leaf Art
• Figure outline/paper
• Leaves of various sizes and shapes, grasses, flowers and other natural materials
• Glue
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NATURAL MATERIALS
Lesson Guide

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Complex .................................... Page 12
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Let’s Learn About
NATURAL MATERIALS

What Are Natural Materials?
Teachers should start this lesson by briefly explaining to students that natural materials are materials that come from plants, animals or the ground. Teachers should also explain that natural materials can have very different properties depending on what they are.

Types of Natural Materials:
- Bamboo
- Clay
- Cotton
- Feathers
- Leather
- Rock
- Silk
- Straw
- Wood
- Wool

How Do We Use Natural Materials?
Explain that many natural materials are used in technology today. Some of these natural materials are: cooking oils like corn, canola and olive; petroleum, which is made into plastic and rayon; wood, which can be used to make paper or furniture; bamboo, leather and cotton, which are also used to make furniture, and cotton can even be used to insulate homes, provide great soundproofing and much more.

Show students images of the Daggett Farmhouse along with the various ways that natural materials would have been used, such as clay dishes, drying herbs, spinning yarn, etc.

Teachers can also show pictures of McGuffey School, made of logs, where students helped with firewood, carried water in wood or metal buckets and did other jobs using natural materials.

Fashion once dictated the use of several natural materials. Straw, cotton felt and thread were the building blocks of hatmaking, and hats were an important part of everyday dress and culture. Teachers can show pictures from Mrs. Cohen’s Millinery.

Activity

Touch Exploration
- When talking about what natural materials are, give students as many natural materials to touch as possible. Encourage students to talk about what they think as they feel the different materials and what they think the source might be: plant, animal or the ground.
- Have students try to determine if there might be natural materials in what they are wearing, based on the feel of the natural materials they have experienced.
- Students can try on as many hats (straw hat, sombrero, felt top hat, cotton canvas hat) as are available.

Links and photos for this section are on Pages 5-11.

Model i Innovation Learning Framework
Stay Curious, Collaborate, Be Empathetic
- Ask questions like what, why, how.
- Talk about helping, working together.
- How did the characters in the stories feel? How might it make others feel?
Let’s Learn About
NATURAL MATERIALS

Activities Inside Daggett Farmhouse in Greenfield Village, 1989

thf.org/collections-and-research/digital-collections/artifact/457906

thf.org/collections-and-research/digital-collections/artifact/457908
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Explore — Links

Activities Inside Daggett Farmhouse in Greenfield Village, 1989

thf.org/collections-and-research/digital-collections/artifact/457912

thf.org/collections-and-research/digital-collections/artifact/457910
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Explore — Links

Activities Inside Daggett Farmhouse in Greenfield Village, 1989

thf.org/collections-and-research/digital-collections/artifact/457914

Additional Resources

Activities Inside Daggett Farmhouse in Greenfield Village, 1989
thf.org/collections-and-research/digital-collections/artifact/457911
thf.org/collections-and-research/digital-collections/artifact/457913

Daggett Farmhouse, 1754
thf.org/collections-and-research/digital-collections/artifact/159341
Let’s Learn About
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Explore — Links

Gardening at McGuffey School, 1967
thf.org/collections-and-research/digital-collections/artifact/350359

Additional Resources
McGuffey School, 1934
thf.org/collections-and-research/digital-collections/artifact/127163
Let’s Learn About
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Top Hat, Worn by William Roddis, circa 1910
thf.org/collections-and-research/digital-collections/artifact/388177

Straw Hat, 1880-1910
thf.org/collections-and-research/digital-collections/artifact/175414
Let’s Learn About
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Sombrero, 1890-1920

thf.org/collections-and-research/digital-collections/artifact/319903

Pillbox Hat, 1960-1965

thf.org/collections-and-research/digital-collections/artifact/421253
Let’s Learn About
NATURAL MATERIALS

Explore — Links

Cloche Hat with Feathers, 1925-1930
thf.org/collections-and-research/digital-collections/artifact/361754

Additional Resources

Bonnet, circa 1840
thf.org/collections-and-research/digital-collections/artifact/71460

Mrs. Cohen’s Millinery, circa 1880
thf.org/collections-and-research/digital-collections/artifact/282686
Establish Context
Ask students what they remember about Thomas Edison, and use their responses to get to the light bulb.

What Is Edison's Menlo Park Complex?
Show pictures of Edison's Menlo Park Complex from the collections of The Henry Ford. This is where Edison and his employees worked on many inventions and innovations.

Explain that Thomas Edison experimented with thousands of plants and other natural materials before he hit upon filaments made of ordinary cotton sewing thread and brightened up our world with this natural material. He continued to improve the light bulb by finding another natural material that burned even longer than cotton.

Today, innovations in light bulbs mean they can last for years and years. Lots of our technology includes natural materials, from metals to fibers.

Model i Innovation Learning Framework
Stay Curious, Learn from Failure
• Ask questions like what, why, how.
• Talk about “trying again,” what’s another way to...

Links and photos for this section are on Pages 13-14.
Let’s Learn About
NATURAL MATERIALS

Artifact of the Day — Links

Edison Paper Horseshoe Filament Lamp, 1879
thf.org/collections-and-research/digital-collections/artifact/199162

Additional Resources
Edison's Menlo Park Complex – Laboratory
thf.org/collections-and-research/digital-collections/artifact/179489
Let’s Learn About
NATURAL MATERIALS

Artifact of the Day — Links

Story Bots Presents Great Inventors: Thomas Edison
youtube.com/watch?v=b1lKwZTtzIY
Let’s Learn About
NATURAL MATERIALS

Discover

How Versatile Are Natural Materials?

- Ask students how many ways they think natural materials could be used.
- Ask students what other ways they could use some of the natural materials they have seen today.

Activity

Students will do classroom chores using sponges, brooms, baskets and other natural materials to get the job done. Chores could include: sweep with straw broom, clean with natural sponge, put toys in wicker basket or wooden bucket, etc.

Model i Innovation Learning Framework

Stay Curious, Collaborate

- Ask questions like what, why, how.
- Talk about helping, working together.
Let’s Learn About

NATURAL MATERIALS

Create — What Can You Make with Natural Materials?

Project 1: Make A Crown

Cut paper strips 2 inches wide and long enough to make a headband for each student. Each student should design their own crown with leaves, grass, moss, feathers, straw, etc., and glue to their headband with adult assistance.

Materials

- Brown paper bags (grocery bags are sturdier; lunch bags can work)
- Duct tape
- Scissors
- Leaves, flowers, sticks, grasses and other natural materials

Instructions

1. Measure the circumference of each student’s head.
2. Add 2” to that measurement and cut a 2” wide strip from the paper bag to fit around each head plus seam.
3. Cut another paper bag strip the same length but with one straight edge and one side in a zigzag pattern.
4. Cut a piece of duct tape the same length. Lay it down on a flat surface, sticky side up.
5. Attach plain strip of paper bag along the bottom edge of the duct tape. Make sure any printing on the bag faces down.
6. Attach the shaped strip of paper bag along the top edge of the duct tape, leaving as much sticky surface of tape exposed as possible.
7. Attach natural materials to sticky surface of duct tape to decorate the crowns. Leave a couple of inches at one end free of natural materials.
8. Attach clean end of band to inside of opposite end of band to fit student’s head.

Model i Innovation Learning Framework

Design

- Make, build and create.
Let’s Learn About
NATURAL MATERIALS

Create — What Can You Make with Natural Materials?

Project 2: Painting

Tell students about George Washington Carver, a famous American who gave us hundreds of products to make using plants. Carver also used plants to create paints for his paintings, which can be demonstrated to students with this project.

Materials

• Egg yolks (to bind paint pigment)
• Distilled vinegar
• Water
• Paintbrushes
• Paper
• Pink/Purple/Red — Berries, cherries, beets, roses, hibiscus, basil leaves, pomegranates
• Blue — Blueberries, purple grapes, indigo, red cabbage, elderberries
• Grey/Black — Wood ash, charcoal
• White — Chalk, talcum powder
• Yellow — Onion skins, turmeric, sunflower petals, bay leaves, dandelion flowers, marigolds, celery leaves
• Green — Artichokes, spinach, peppermint leaves, lilacs, grass
• Orange — Chili powder, paprika, carrots

Instructions

1. For harder material like chalk or charcoal, grind the material down to a fine powder.
2. Mix egg yolk with a bit of vinegar and water. Add powder to mixture.
3. Crush berries and strain to make juice that paints like watercolor.
4. Dry materials like onion skins must be simmered until you see the dye released into the water. Strain. Paint with the water.
5. Provide paper and paintbrushes to students so they can create their own picture.

Links and photos for this section are on Page 18.

Model i Innovation Learning Framework

Design

• Make, build and create.
Let’s Learn About
NATURAL MATERIALS

Create — What Can You Make with Natural Materials?

George Washington Carver Examining Soy Fiber,
Soybean Laboratory at Greenfield Village, 1939
thf.org/collections-and-research/digital-collections/artifact/268598

Additional Resources

George Washington Carver at Dedication of George Washington Carver Cabin, Greenfield Village, 1942
thf.org/collections-and-research/digital-collections/artifact/189004

George Washington Carver Holding Fabric from Soy Fibers, 1939
thf.org/collections-and-research/digital-collections/artifact/46010

Pencil Drawing of Yucca Gloriosus, by George Washington Carver, 1937-1943
thf.org/collections-and-research/digital-collections/artifact/20235
Let’s Learn About
NATURAL MATERIALS
Create — What Can You Make with Natural Materials?

Project 3: Leaf Art
Give students an outline of a person and natural materials to dress the figure. **Alternately:** Have students make their own leaf person with leaves and other natural materials. Adult assistance with glue needed. Students could also paint trees and add real leaves for the tops.

**Materials**
- Figure outline/paper
- Leaves of various sizes and shapes, grasses, flowers and other natural materials
- Glue

**Instructions**
1. Give each student a blank figure or sheet of paper.
2. Let students choose a variety of natural materials to create “clothes” for their figure. **Alternately:** Let students choose a variety of natural materials to arrange into a picture.
3. Assist students in gluing materials in place.

Model i Innovation Learning Framework
**Design**
- Make, build and create.
Let's Learn About
NATURAL MATERIALS

Inspiring Stories

Read Stories to Inspire Your Students

Feathers for Lunch
by Lois Ehlert

Magic Broom
by Charles Reasoner

Model i Innovation Learning Framework

Be Empathetic, Uncover

- How did the characters in the stories feel? How might it make others feel?
- What problems does this material help us solve?
Let’s Learn About
NATURAL MATERIALS

Review & Extend

Ask Students Specific and Open-Ended Questions

• What was your favorite activity with natural materials?
• What else could we make with natural materials?
• How do you think Thomas Edison felt when his experiments didn’t work?
• Why do you think he kept on trying?
• What do you do when you try something that doesn’t work?

Family Connection
Send the worksheet on Page 22 home with students to be completed at the end of the lesson.

Coloring Sheet
Have students color the picture on Page 23 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.
Let’s Learn About
NATURAL MATERIALS

Take the Learning Home

We are learning about natural materials because they are used in many items we use every day.

Please take your student on a scavenger hunt through your home and neighborhood to see what natural items you can find. 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.

Oh Say Can You Seed?
All About Flowering Plants
by Bonnie Worth

From Seed to Plant
by Gail Gibbons

Goldie and Bear:
Training of the Broom
by Disney Book Group
Let’s Learn About
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Top Hat, Straw Hat

Coloring Sheet