



Arts-Integrated Unit: Native Maine Plants & Trees

Suggested Grades: 4 or 5

Academic Content Area(s): Science and Literacy

Arts Discipline: Bookmaking, printmaking, and drawing

Unit Length: 4-6 weeks

Classroom hours: 10-12

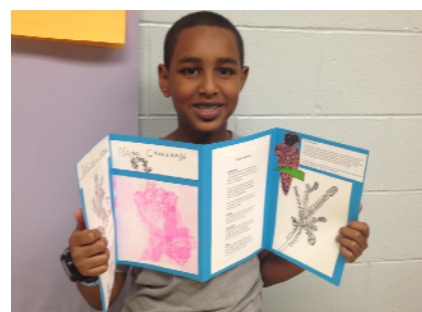
In this collaborative unit designed by Side x Side teaching artists and classroom teachers, students will study pollination and learn the phenology of native Maine plants and trees including how to identify them, scientific names, characteristics, and habitats. Students will also learn printmaking, observational drawing, and comic drawing. Using thoughtful design principles, students will combine their creative components and written research into a handmade book.

Key Features

- Aligned with Common Core ELA and Next Generation Science standards, Maine Learning Results in Visual and Performing arts, and integrated with school and grade-level curriculum.
- Program Kickoff and presentation with teaching artist and Wildlife Ecologist expert on pollination, bees, and the impact on plant and tree growth in the local community.
- Literacy focus on scientific research and nonfiction writing to demonstrate learning; writing concise, informative sections on specific native Maine plant or tree species.
- Arts focus on observational scientific drawing, comic drawing, monoprintmaking of botanical species samples, and bookmaking.
- Program Celebration of Learning event displaying handmade informational books featuring scientific illustrations and botanical prints through a gallery walk and Q&A.
- Detailed program documentation: unit design map, lesson plans, supply and resource lists, arts and content connections.

Side x Side ignites academic excellence in education through comprehensive arts-based programs bringing critical thinking, creativity and innovation into the classroom. Through community partnerships with the University of Southern Maine, local school districts and artists, professionals and colleges, Side x Side integrates science, technology, literacy and the humanities with the arts to enhance school curriculum.

Side x Side programs are funded by the US Department of Education through an AEEDD grant.



Integrated Unit of Study: Bookmaking: Native Maine Plants & Trees

Grade or Specialty, Unit Length	Designed by:
4th grade, 4-6 weeks/10-12 classroom hours	Teaching Artist: Anne Ackerman

Description/Big Idea:
We can represent our knowledge in science and literacy through printmaking, close observation, and sequencing information. Students will study the life cycle and seasonal changes of native Maine plants and trees, learn about the characteristics, scientific names, identification, habitats, and adaptations. They will study pollination, insect services, fertilization, and the anatomy of flowers and insects. Through writing, printmaking, scientific drawing, and bookmaking, students will teach others about their plants and trees.

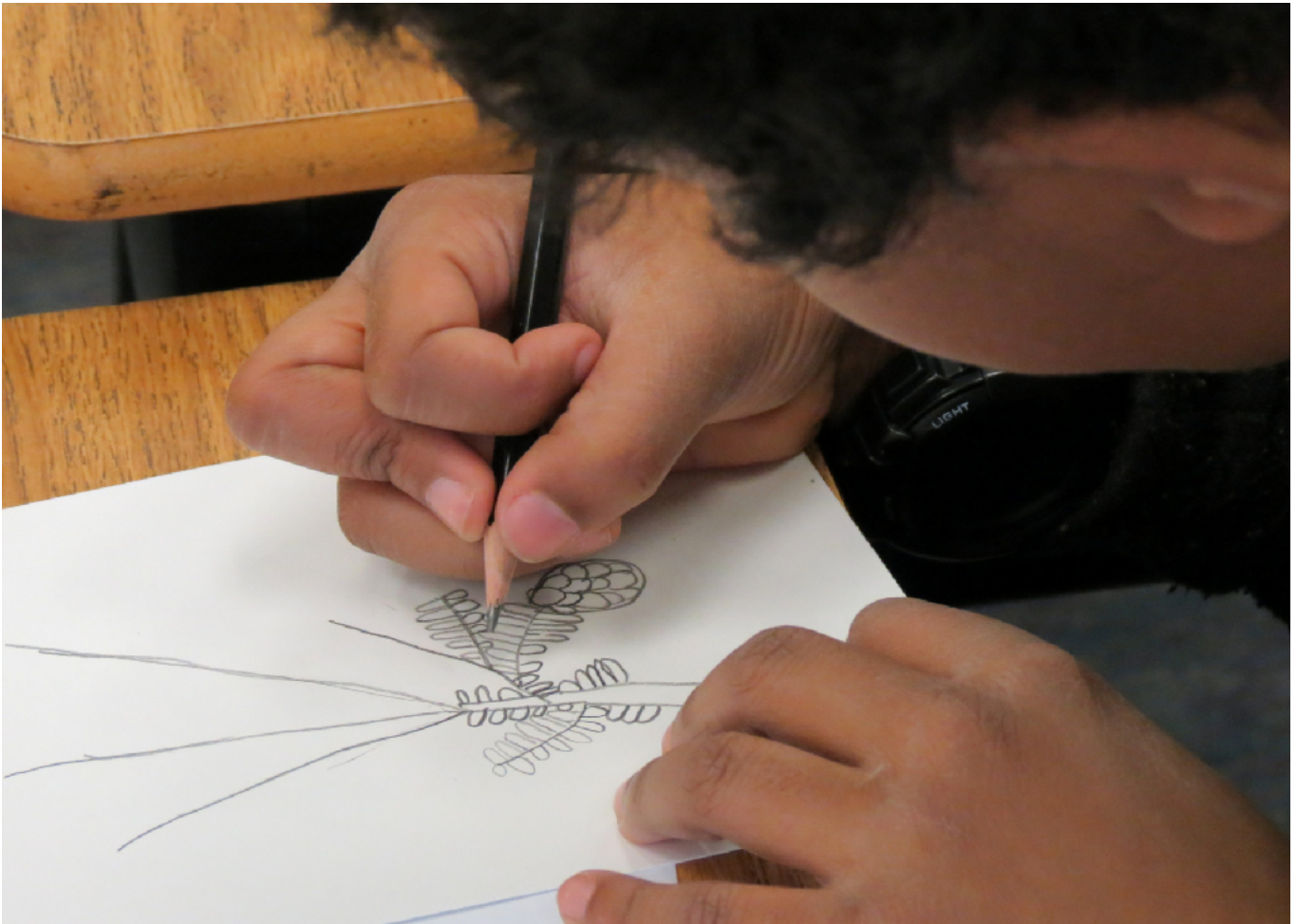
Resources + Materials:
Field expert; Wildlife ecologist Deb Perkins from First Light Wildlife Habitats, magnifying glasses and field journals, bookmaking supplies and presentation space.

Learning Goals and Standards	
<p>Academic content areas (<i>english, math, science, etc.</i>)</p> <p>Based on the scientific writing literacy unit, students will learn and understand:</p> <ul style="list-style-type: none"> • How pollination supports plants/ tree growth • The anatomy of flowers and insects • How to conduct research on Maine plants/ trees 	<p>Arts Discipline (<i>poetry, performance, sculpture, etc.</i>)</p> <ul style="list-style-type: none"> • Create and use botanical prints for plants/tree identification • Draw from observation to illustrate species • Form a book structure to sequence and display literacy and science content
<p>I can (<i>in kid language</i>):</p> <ul style="list-style-type: none"> ... research native Maine plants/trees. ... identify species & the anatomy of plants/ trees ... write about my research in a clear and instructive way. 	<p>I can (<i>in kid language</i>):</p> <ul style="list-style-type: none"> ... make a print of the anatomy of a plant and tree leaf ... create a scientific drawing from observation ... create a book about my species that shares what I have learned.
<p>Core Curriculum Standards:</p> <p>NEXT GENERATION SCIENCE STANDARDS</p> <p>4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.</p> <p>COMMON CORE STATE STANDARDS</p> <p>Reading Standards for Informational Text: CCSS.ELA-Literacy.RI.4.1–4.10</p> <p>Writing: CCSS.ELA-Literacy.W.4.1–4.10</p>	<p>Core ART Standards:</p> <p>NATIONAL CORE ART STANDARDS</p> <p>Anchor Standard 1: Generate and conceptualize artistic ideas and work. VA:Cr4.1.4a</p> <p>Anchor Standard 2: Organize and develop artistic ideas and work. VA:Cr4.1.4a</p> <p>Anchor Standard 6: Convey meaning through the presentation of artistic work. VA:Pr6.1.4a</p> <p>Anchor Standard 10: Synthesize and relate knowledge and personal experiences to make art. VA:Cn10.1.4a</p>

Celebration of Learning and Assessments:
Students will participate in a book share and gallery walk with family members and visiting students from other grades. Formative assessments throughout the unit activities will guide learning.

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Bookmaking: Native Maine Plants & Trees





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UNIT OVERVIEW

Students will study the life cycle and seasonal changes of native Maine plants and trees. Students will learn about the characteristics, scientific name, identification, habitat, and adaptations of each plant and tree that help them to survive. They will also learn about pollination via insect services, fertilization, and the anatomy of flowers and insects. Through writing, printmaking, scientific drawing, and bookmaking, students will teach others about their plants and trees.

BIG IDEA

We can represent our knowledge in science and literacy through printmaking, close observation, and sequencing information.

LEARNING GOALS

Students will understand:

- Pollination and the anatomy of flowers and insects.
- How to create botanical prints that can be used for plant and tree identification.
- How to create observational (scientific) drawings to help illustrate knowledge.
- How to research native Maine plants and trees.
- How science and art are interdisciplinary.
- How the structure of a book can be used to share knowledge.
- How to present research and teach others using a book as a guide.

GRADE LEVEL: Fourth Grade

ART FORM: Bookmaking

INTEGRATED SUBJECTS: Literacy and Science

sidexside

Project Kick-off:

Pollinator presentation and introduction to project. First Light Wildlife Habitats: Deb Perkins, Wildlife Ecologist. Slide show pollinator talk, up close look at bee collection, and looking at flowers with magnifying glasses in the school garden. Timeframe: 1 hour

Lesson 1: Learning about Printmaking

Students will be given a printmaking demo in small groups as they rotate through the printmaking station: 1 hour

Lesson 2: Observational Drawing

Students will draw part of their plant, for example, branch with needles, leaf and stem, etc. Reference drawing materials and plants will be provided: 1 hour

Lesson 3: Drawing Continued

Students will either create a comic drawing depicting the plant's predator(s), a diagram drawing of the plant, or a life cycle drawing of the plant: 1 hour

Lesson 4: Components

Students will finish up all the individual pieces of their books: 1 hour

Lesson 5: Assembly

Students will assemble all the components into completed books: 1.5 hours

Celebration of Learning

Students will participate in a book share and gallery walk: 45 min-1 hour

Appendix: Printmaking Guide

Step-by-step instructions on printmaking with gelatin

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Bookmaking: Native Maine Plants & Trees

LESSON 1: Learning about Printmaking

MATERIALS

Per student:

- pre-folded accordion book
- disposable gloves
- pencils
- erasers
- thin sharpies
- manilla envelopes

To share:

- gelatin trays
- water-soluble printing ink
- brayers
- printing paper cut to size
- title papers
- 2-sided color cardstock
- plants
- checklist for book
- plexiglass
- table coverings
- masking tape
- water containers to hold plant specimens
- paper towels

VOCABULARY

botanical printmaking
gelatin plate
plexiglass
brayer
pulling a print
accordion book form
title page

LEARNING GOALS

Students will understand:

- How to use ink.
- How to prepare the gelatin for printing.
- How to print a plant.
- How to make a double print.

Timeframe: 1 hour

Students will be given a printmaking demo in small groups as they rotate through the printmaking station.

Set Up:

Prepare the classroom...

- Cover tables with disposable table covering or cloth that can be washed.
- Organize and lay out paper, pencils, disposable gloves, and paper towels.
- Create four printmaking stations each with a tray of gelatin, plexiglass, brayer, ink, and plants.
- Make sure student names are on the back of their paper.

INSTRUCTIONS

Step 1: Demonstration

Begin by demonstrating how to prepare the ink on the plexiglass and how to use a brayer. Then demonstrate how to ink the gelatin and place a plant on the gelatin (vein side down). Show how to pull the first print and then a subsequent “ghost” print. Then demonstrate how to create a double print.

Step 1: Printmaking

Hand out a checklist and manila envelope to each student to keep all their materials in. Divide class into groups of 4 or 5 students and assign them a printmaking station. Each student should print 3-5 prints of their specific plant/tree.

Step 2: Designing Books

While students are not printing they can choose the color of their book (pre-folded accordion books), the paper for their seed pocket, and book title paper. Students can begin to work on their title piece and plan their books on the manilla envelope.

Step 3: Wrap Up

Engage students in reflecting on the steps of the printmaking process on a piece of paper. Also introduce the game “Rose and Thorn” as a way to reflect on what was challenging to the students and what they enjoyed or were most proud of from the session.



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Bookmaking: Native Maine Plants & Trees



LESSON 2: Observational Drawing

MATERIALS

Per student:

- pencil / eraser
- thin sharpie
- paper cut to size

To share:

- pencil sharpeners
- examples of Kate Furbish's work
- student book examples
- reference materials: drawings and plants

VOCABULARY

line drawing
scientific drawing

LEARNING GOALS:

Students will understand:

- How to draw light until you get it right.
- How to use a line drawing as reference.
- How to troubleshoot and problem-solve.
- How to create observational drawings of their plants and details.



Timeframe: 1 hour

Students will draw part of their plant, for example, branch with needles, leaf and stem, etc. Reference drawing materials and plants will be provided.

INSTRUCTIONS

Step 1: Introduction

Begin with a quick introduction to Kate Furbish, a Victorian botanist and illustrator from Maine and a pioneer for women in science. Give an explanation of what a line drawing is and what a scientific drawing is. Conduct a demonstration on how to use the line drawing reference of each plant, focusing on the shape of the leaf and how to sketch it lightly.

Teaching Tip: techniques for students who are feeling stuck:

1. Turn paper upside down to focus on shapes.
2. Cover up some of the paper, so there is less information to process.

Step 2: Drawing

Students will draw part of their plant, for example: branch with needles, leaf, and stem. Reference drawing materials and plants will be provided. Each student will have a plant reference line drawing sheet, paper, pencils, and erasers. Students will work lightly in pencil and once they are done, check in with the teaching artist before they are given the okay to go over their drawing with a thin sharpie. Pencil lines will then be erased along with smudges. Students may work on a smaller drawing of their plant's seed, flower, berry, pinecone, etc., when they finish the first drawing.

Step 3: Wrap Up

Engage students in reflecting on the steps (and tips) of the drawing process on a piece of paper. Also use the game “Rose and Thorn” as a way to reflect on what was challenging for the students and what they enjoyed or were most proud of from the session.





LESSON 3: Drawing Continued

MATERIALS

Per student:

- pencil
- eraser
- paper cut to size

To share:

- pencil sharpeners
- thin sharpies
- line drawing reference materials
- examples of student work

VOCABULARY

diagram
detail drawing
comic drawing
grid

LEARNING GOALS:

Students will understand:

- How to create a comic.
- How to draw light 'til you get it right.
- How to create a diagram drawing of a plant.

Timeframe: 1 hour

Students will either create a comic drawing depicting the plant's predator(s), a diagram drawing of the plant, or a life cycle drawing of the plant.

INSTRUCTIONS

Step 1: Demo

Begin with a demonstration of how each drawing can be created. For example, students can use the comic form to create a story about the predator of the plant, but they could also use that format for the life cycle of the plant. A diagram drawing would be created using the drawing techniques learned in the previous session.

Step 2: Drawing

Each student will have paper, pencil, and eraser. Students will work lightly in pencil on their comic or diagram drawings. Once they are done, they will check in with the teaching artist before they are given the okay to go over their drawing with a thin sharpie. Pencil lines will then be erased along with smudges.

Extra Time?

Students who finish their drawing early can create another drawing if they choose. Keep in mind that the book has a limited number of pages and all the pieces need to fit.

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LESSON 4: Components

MATERIALS

Per student:

- pencil
- eraser
- paper cut to size

To share:

- paper cutter
- thin sharpies
- drawing references

VOCABULARY

components
layout
design

LEARNING GOALS

Students will understand:

- How to draw a straight line using 3 measured points with a ruler.
- How to plan out the design for a book.

Timeframe: 1 hour (may be multiple sessions)

During these component sessions, students will finish individual pieces of their books in order to be ready to assemble their books in the next session.

INSTRUCTIONS

Step 1: Review

Each student should check their list of what needs to be in the book, review their plan for the layout of their book, and, if time allows, go through the materials and physically put them in the book to make sure they fit.

Step 2: Complete Unfinished Work

The work that needs to be completed depends on the individual class and students. Unfinished work might include the written parts of the books, or the drawing parts. Students should use this time to finish any piece of their book that is incomplete.

Step 3: Crop and Check In

Students can use the paper cutter or scissors to trim paper to fit into their books. They should then check in with a teacher before the end of the session to make sure they are on track.

Step 4: Wrap Up

Lead students in reflecting on the different component pieces they created. How will they be used in the book? What kind of information do they convey? What did they learn about layout and design before assembling their book? Use the “Rose and Thorn” game as a way for students to reflect on what was challenging and what they enjoyed or were most proud of from the session.



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LESSON 5: Assembly

MATERIALS

Per student:

- QR code cut to size
- pencils
- erasers
- wildflower seed envelopes

To share:

- wet glue or Yes paste
- glue sticks
- double-sided sticky tape
- thin sharpies
- paper towels
- extra paper materials

VOCABULARY

paste vs. glue

LEARNING GOALS

Students will understand:

- How to use wet glue (or paste) and what to do if it starts to ooze out.
- How to use double sided sticky tape.
- How to use a glue stick.
- How to problem solve when things don't go as planned.

Timeframe: 1 hour

Students will assemble all the components into completed books.

Set Up:

- Have students clear their desks of all materials except their manila folder.
- Give each student an extra piece of scrap paper to use under the components they are gluing to protect their book from glue.
- Provide each student a small wet glue, a glue stick, and a paper towel at their desk.

INSTRUCTIONS

Step 1: Walk-Through

Take students on a walk-through of the assembly process, making sure the directions and expectations are clear. Students should have gone through their materials in the previous session, and should have a plan of what prints they want to use and where they want to place their drawings and written information in their books.

Step 2: Demonstration

Have students take out the materials that they will be using for the book, leaving all the extra pieces in their envelopes. Demonstrate how to glue (using wet glue) the first component of the book onto the cover (it could be a print or a drawing). Clearly demonstrate where the glue should go on the paper and how much glue to use. Remind students to be patient while the glue dries.

Step 3: Gluing

Guide the students in gluing on their first piece as a group so everyone gets the hang of it and can troubleshoot together. Then lead students in gluing their next pieces. The envelope with the wild seeds should be the last thing that students add to their book.

Step 4: Wrap Up

Lead students in reflecting on the content of their books and the assembly process. Does their book demonstrate the criteria on their checklist? Can another student use their book as a field guide to learn about and identify a specific plant or tree? Are they satisfied with the craft of the book? Use the “Rose and Thorn” game as a way for the students to reflect on what was challenging and what they enjoyed or were most proud of from the session.



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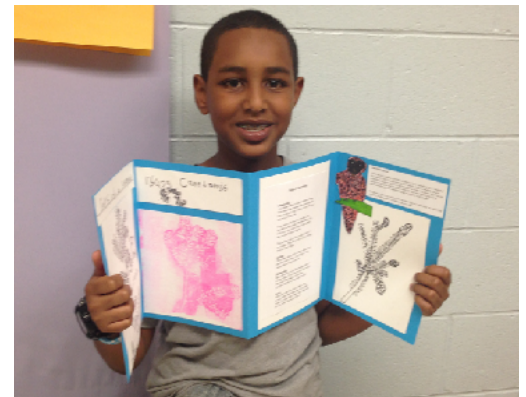
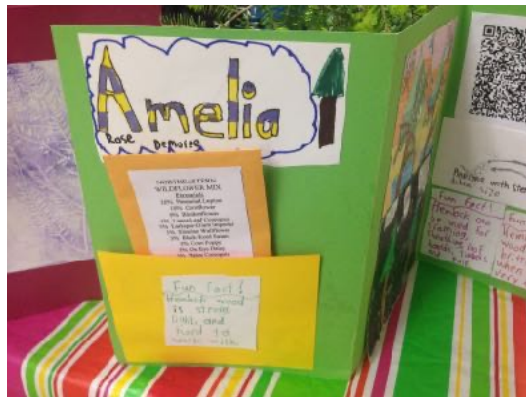
CELEBRATION OF LEARNING

Timeframe: 45 minutes - 1 hour

Students will participate in a book share and gallery walk with family members and visiting students from other grades.

Book Share and Gallery Walk

Use large tables for book display and include examples of the plants and trees that the students used for their research (we recommend using large jars and vases to hold the plants and tree samples so they do not wilt). This can be done by grouping the plants and books together by species. Students will stand behind the tables that feature their books and will be ready to share the bookmaking process and information about their plants and trees with attendees.





SET UP: Before you begin, have these materials ready

Brayer, water soluble printing ink, glass or plexiglass, gelatin plate, botanical specimens, and paper.

1.



Start with small squirts of ink and place them near the corner of the glass or plexiglass.

2.



Spread the ink out evenly on the glass or plexiglass.

3.



Ink up the gelatin plate. A small amount of ink is all you need.

4.



The gelatin plate inked and ready to print.

5.



Place the specimen on the gelatin plate vein side down (if it has veins).

6.



Place paper on top and, using the tips of your fingers, gently rub all over the paper. Make sure you rub the entire surface area.

7.



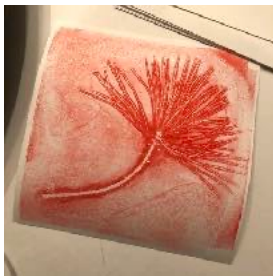
Pull up the first print which will be the negative of the image. After you pull this print, GENTLY remove the botanical specimen.

8.



Using the remaining ink on the gelatin, pull the second ghost print. Repeat the same process with a new sheet of paper: using the tips of your fingers, gently rub all over the paper. Make sure you rub the entire surface area to get a good print.

9.



The ghost print can be used for specimen identification.

10.



Try double printing. Use extra prints or the negative prints, to make a second print on top of the existing image. Follow the same steps as above.

11.



Here are some examples of how prints can be combined.

COMMON CORE STATE STANDARDS
corestandards.org

Reading Standards for Informational Text:
 CCSS.ELA-Literacy.RI.4.1–4.10

Writing:
 CCSS.ELA-Literacy.W.4.1–4.10

Speaking and Listening:
 CCSS.ELA-Literacy.SL.4.1–10

Vocab Acquisition:
 CCSS.ELA-Literacy.L.4.1–10

Math, Measurement and Data:
 CCSS.MATH.CONTENT.4MD.A.1–4

NEXT GENERATION SCIENCE STANDARDS
nextgenscience.org

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

21st CENTURY STUDENT SKILLS
p21.org

21st Century Interdisciplinary Themes:
 Environmental Literacy
 Global Awareness

Learning and Innovation Skills:
 Creativity and Innovation
 Critical Thinking and Problem Solving
 Communication and Collaboration

Information, Media and Technology Skills:
 Information Literacy

Life And Career Skills:
 Social and Cross-Cultural Skills
 Leadership and Responsibility
 Flexibility and Adaptability

NATIONAL CORE ART STANDARDS
nationalartsstandards.org

CREATING

Anchor Standard 1: Generate and conceptualize artistic ideas and work.
 VA:Cr4.1.4a

Anchor Standard 2: Organize and develop artistic ideas and work.
 VA:Cr4.1.4a

Anchor Standard 3: Refine and complete artistic work.
 VA:Cr4.1.4a

PERFORMING / PRESENTING / PRODUCING

Anchor Standard 4: Select, analyze, and interpret artistic work for presentation.
 VA:Pr5.1.4a

Anchor Standard 6: Convey meaning through the presentation of artistic work.
 VA:Pr6.1.4a

RESPONDING

Anchor Standard 7: Perceive and analyze artistic work.
 VA:Re.7.1.4a

Anchor Standard 8: Interpret intent and meaning in artistic work.
 VA:Re8.1.4a

CONNECTING

Anchor Standard 10: Synthesize and relate knowledge and personal experiences to make art.
 VA:Cn10.1.4a