Knock Down the Silos:
Outdoor Science Learning and Literature

Virginia Association of Science Teachers PDI

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Hotel Roanoke, Virginia

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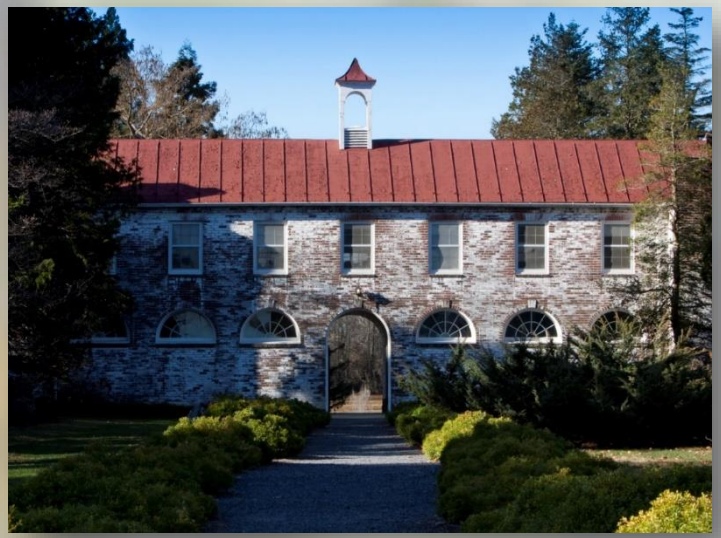
Field Ecology Research Station

State Arboretum of Virginia



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Our Mission: To increase understanding of the natural environment through research and education.

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Education Outreach

- Hands-on, outdoor, experiential field investigations
- ~7000 PK-12 students per year
- Inquiry, Science Process and Skills focused programs
- Correlated to state and national standards
- Field-based STEM Learning
- Teacher professional development

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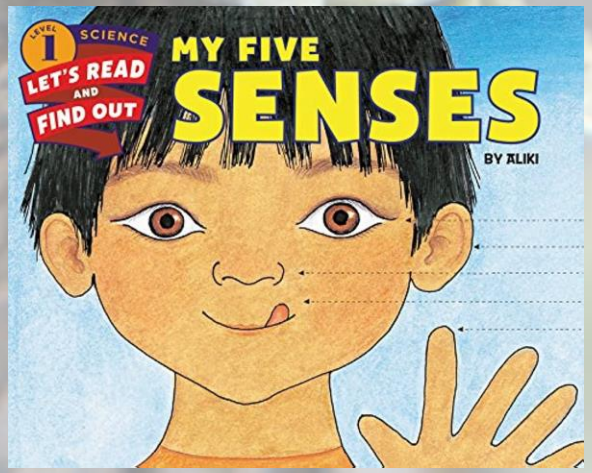
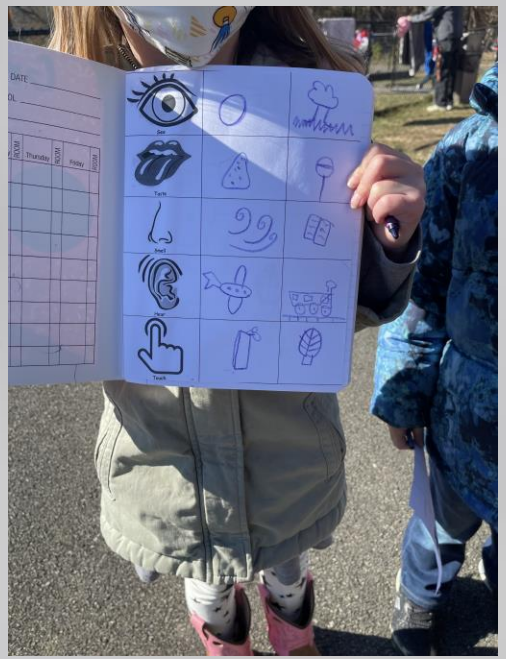
Plan

- Introduction
- Background of the project
- Resource development
- Model an activity
- Reflect & Share resources

K-3 Literacy in the Schoolyard

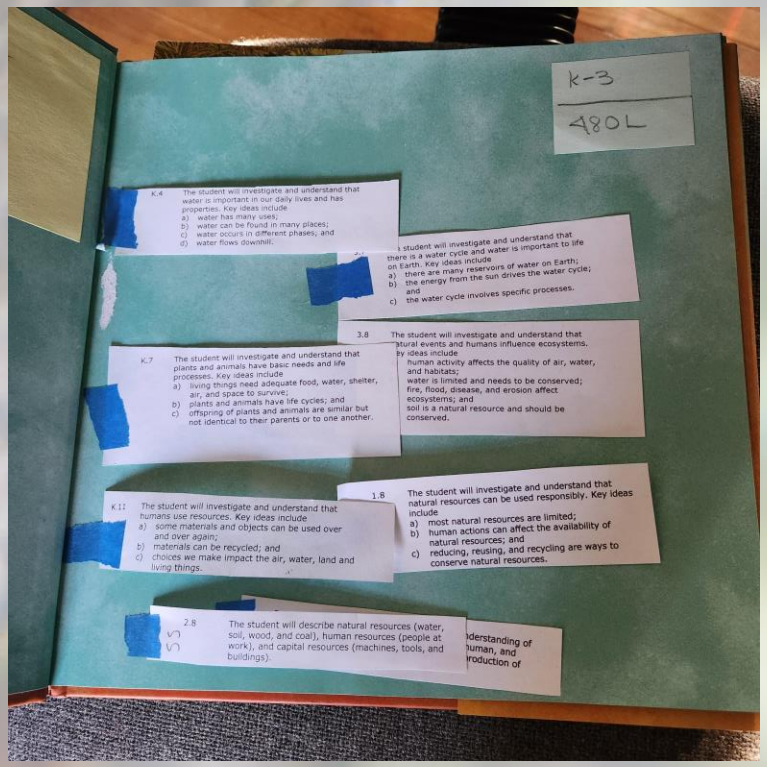


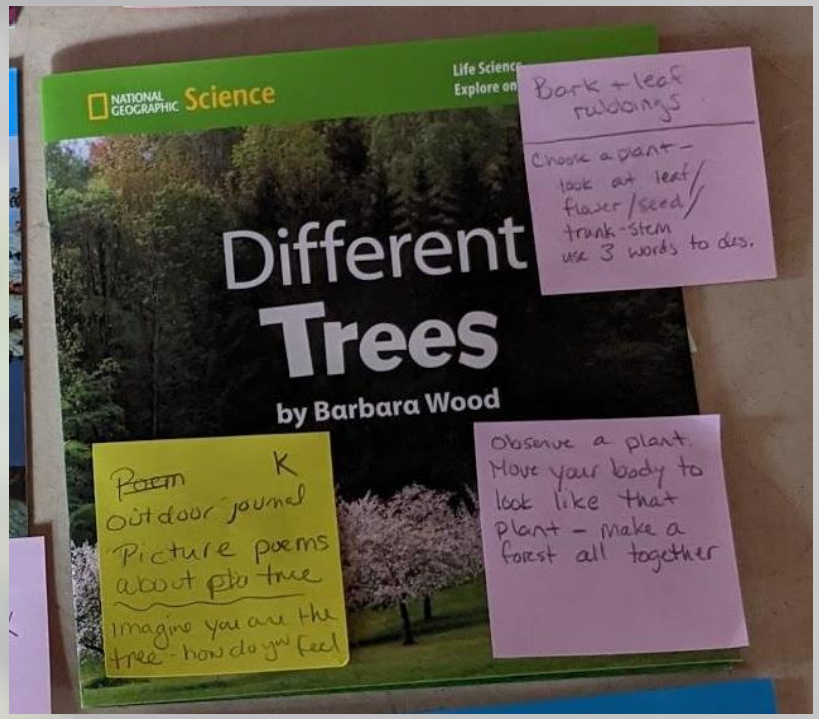


https://blandy.virginia.edu/content/ccps-noaa-k-3-literacy-project

This project was funded through an award from the National Oceanic and Atmospheric Association, Award # NA18NMF4570315

Resource Development





Resource Development

Blandy lesson plan template adapted from K. Lison

Required information during the PD

Lesson Title	Animal Adaptations	**Planned Teaching Date**	

Learning Objective

Through reading, writing reflection, and an outdoor investigation students gain an understanding of some physical (camouflage, mimicry) and behavioral adaptations that can protect an animal from predation.

Essential Question (s)

1. How do physical and behavioral adaptations (such as camouflage, behaviors, and mimicry) help an animal survive in its habitat?
2. How are these physical features and behaviors examples of an animal adapting to its environment?

Materials/Supplies/Data Sheets

Reading: Student journals & pencils for writing
Outdoor activity: Variety of toy animals with various coloration patterns
Whiteboard clipboards, datasheet & pencil

Bloom's Level and Question(s) or DOK

Reading, Writing, & Science Literacy Connections	**SOL Emphasis**
National Geographic Book *Tricks, Traps, and Tools*	Science 3.1f ,3.4b English 3.4, 3.6 b), d), f), g)
Supplementary Book *Looking for Animals* by Lawrence F. Lowery (NSTA Press)	Science 3.4b English 3.4
Outdoor Activity (connected to the readings)- *Color Crazy* from Project Wild	Science 3.4b
Writing Activity Record observations about camouflage during the outdoor activity.	English 3.9

Differentiation

For the journaling activity, some students can draw and color examples of animals with camouflage and mimicry instead of writing in their journals. They can explain their examples to you.
Ladders are differentiated for three different reading levels.

Assessment	**Vocabulary**
Formative. During the engage activity, are students accessing prior knowledge to discuss why some animals are easy to find and some are not?Are they also discussing and how these features can be an advantage? **Summative.** Color Crazy- Show photos of camouflage and mimicry. Can students differentiate between camouflage and mimicry when they see examples of animals in different habitats? Can students explain the adaptive advantages of these physical characteristics?	**Adaptation, camouflage, mimicry, physical adaptations, behavioral adaptations (Review words:** habitat, survival, physical characteristics**)**

Modified a lesson template from the teachers to ensure familiarity and usage.

Model an Activity

Share your Discoveries.

How can you apply resoruces used here in your learning habitat?

USDA and Forest Service: Learn about Lichens

Online Resources

- Blandy K-3 https://blandy.virginia.edu/content/ccps-noaa-k-3-literacy-project
- K-3 Lesson Plans https://drive.google.com/drive/folders/12CWBxtu3_3IRwk_PK14nhNtv0LG8ppZp?usp=drive_link
- Picture Perfect Science https://www.nsta.org/book-series/picture-perfect-science
- Slides of Teacher Gains https://drive.google.com/drive/u/0/folders/1sSqdTqbv1JzZPtue7nGspOeBOHx-bfQg

Thank you!

Blandy Education Web Pages & Resources

https://blandy.virginia.edu/pk-12-education

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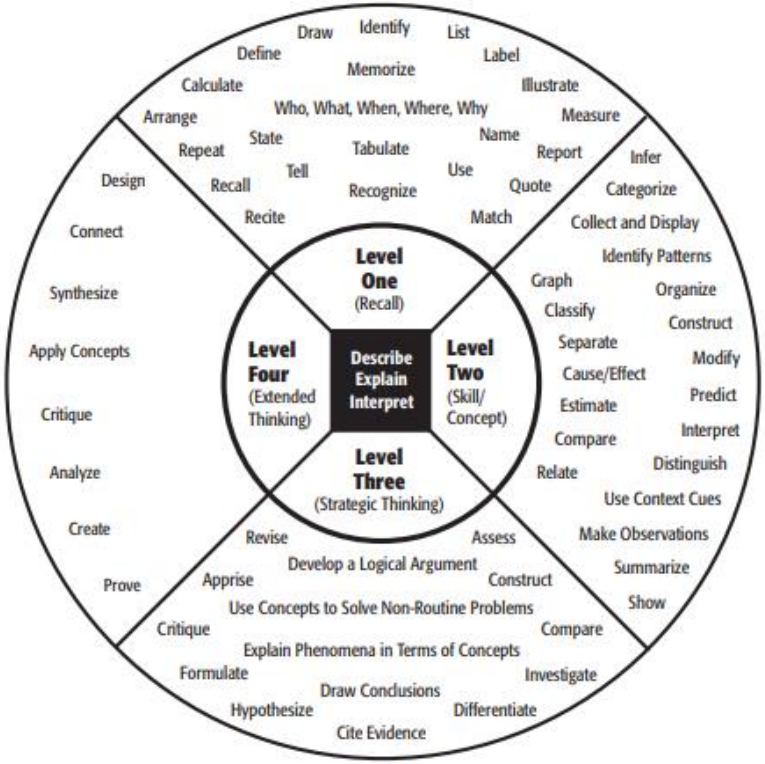
Depth of Knowledge (DOK) Levels



Level One Activities	Level Two Activities	Level Three Activities	Level Four Activities
Recall elements and details of story structure, such as sequence of events, character, plot and setting.	Identify and summarize the major events in a narrative.	Support ideas with details and examples.	Conduct a project that requires specifying a problem, designing and conducting an experiment, analyzing its data, and reporting results/ solutions.
Conduct basic mathematical calculations.	Use context cues to identify the meaning of unfamiliar words.	Use voice appropriate to the purpose and audience.	Apply mathematical model to illuminate a problem or situation.
Label locations on a map.	Solve routine multiple-step problems.	Identify research questions and design investigations for a scientific problem.	Analyze and synthesize information from multiple sources.
Represent in words or diagrams a scientific concept or relationship.	Describe the cause/effect of a particular event.	Develop a scientific model for a complex situation.	Describe and illustrate how common themes are found across texts from different cultures.
Perform routine procedures like measuring length or using punctuation marks correctly.	Identify patterns in events or behavior.	Determine the author's purpose and describe how it affects the interpretation of a reading selection.	Design a mathematical model to inform and solve a practical or abstract situation.
Describe the features of a place or people.	Formulate a routine problem given data and conditions.	Apply a concept in other contexts.	
	Organize, represent and interpret data.		

Webb, Norman L. and others. "Web Alignment Tool" 24 July 2005. Wisconsin Center of Educational Research. University of Wisconsin-Madison. 2 Feb. 2006. <http://www.wcer.wisc.edu/WAT/index.aspx>.

[Dept of Knowledge chart shared by New Jersey Department of Education]

Required information during the PD

Lesson Title	Letters and Leaves	Planned Teaching Date	

Content Objective

Exploring and understanding the physical properties of leaves through multiple senses

Essential Question (s)

How can we compare the physical properties of leaves? How can we use those properties to create something new?

Materials

- Journals or pages (with letters if needed), writing tools if needed
- Gluesticks
- Paper grocery bag
- *Different Trees*
- *Leaf Man*

Bloom's Level and Question(s) or DOK

Recall: identify letters, different body parts are used for different senses
Skill/Concept: Observe, Collect, Compare leaves using different senses, graph frequency of letters
Strategic thinking: Construct a creature out of leaves

Reading, Writing, & Science Literacy Connections	SOL Emphasis
National Geographic Book Title: *Different Trees*	2018 Science: **K.3**, K.7, 1.4
Supplementary Book Title *Leaf Man* by Lois Ehlert	2018 Science: **K.3**, 1.4, 2.5 2017 Eng: K.7 (adjectives)
Outdoor Activity (connected to the readings) Leaf collection, sensory observation	2018 Science K.1, **K.3, K.5**
Writing Activity Leaf letter mosaic	2017 Eng: K.6

Differentiation

Reading/writing instruction adjusted to the ability of the students.

Assessment	Vocabulary
Formative- **Summative-**	

Hook/Engage

Indoor/outdoor: Read *Different Trees*
Indoor/outdoor: Discuss parts of a tree, and the words that describe the trees as different. What parts of a tree were compared? What senses were used to explore the different trees?

Guided Lesson/Instructional Strategy

Outdoor: Leaf collection - fill a paper grocery bag with leaves. Consider giving specific instructions, for example: find one big leaf and one small leaf, find a smooth leaf and a leaf with jagged edges, find leaves of different colors...

Indoor/outdoor: Leaves and senses - "Looking at Leaves" from *Growing Up Wild*. During the PD we will complete this activity all together on one big poster, however this could be done in small groups or independently. Alternatively, students could develop oral skills by making video recordings of themselves describing what they sense.

- Students select and carefully observe a leaf. They describe and record what they smell, see, hear, and feel (omit taste unless food leaves are used).

Indoor/outdoor: Read *Leaf Man*

Indoor/outdoor: Letters and Leaves collage:
Depending on the abilities of your students, have prepared block letters (upper and lowercases) of the first letter of their name, have them write the letters in larger print in their journal, have them write their entire full name, or perhaps have them write the name of a type of tree.
Students glue leaves over the letters to fill it up. Then use extra leaves to try to create a leaf creature/picture that starts with their letter. Leaves may be cut or torn to fit. It could be fun to have a hole punch to make leaf confetti

Indoor/outdoor: Have students arrange open journals in alphabetical order. Graph the frequency of the letters.

Technology/Computer Science	Expected student products or learning objectives met
Students can make video recordings of what they sensed. Use a smartboard to make a simple graph of letters used	-Mandatory: Use of senses other than taste to describe leaves, letter leaf collage -Optional/preferred:
Reflection/Notes	**Supporting Resources**
	Extension activities: *Growing Up Wild* p 30 - "Who Lives in Trees?" and *More Picture Perfect Science* p 109 - "Be a Friend to Trees", *My Leaf Book* by Monica Wellington - create a leaf nature journal, focus on colors, textures, shapes, and senses.