Knock Down the Silos: Outdoor Science Learning and Literature

Virginia Association of Environmental Education

February 24, 2024

George Mason Science & Technology Campus

Manassas, Virginia

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Blandy Experimental Farm

University of Virginia

Field Ecology Research Station

State Arboretum of Virginia











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









BLANDY EXPERIMENTAL FARM





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





University
Virginia

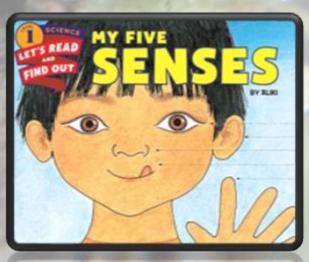


Plan

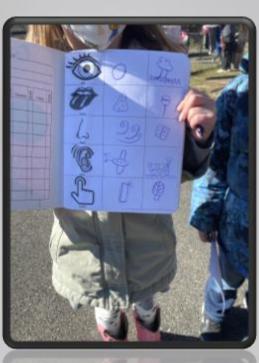


- Introduction
- Background to the project
- Resource development
- Model an activity
- Reflect & Share resources

K-3 Literacy in the Schoolyard



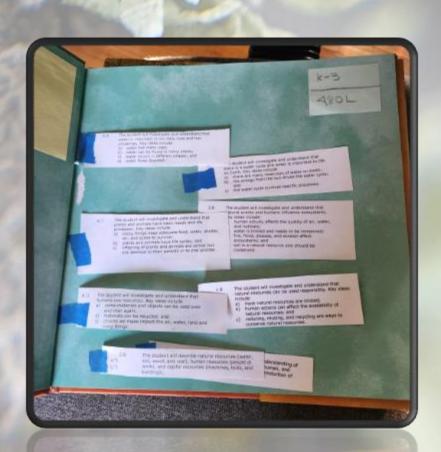


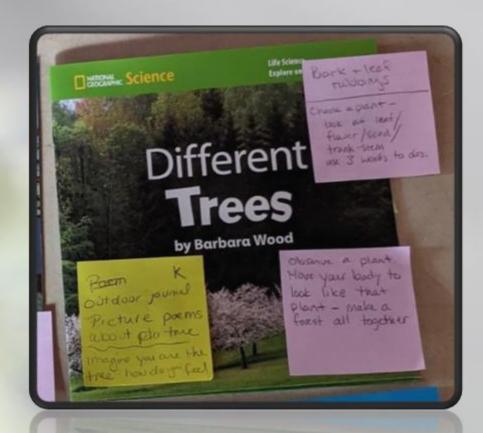


https://blandy.virginia.edu/content/ccps-noaa-k-3-literacy-project

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

Resource Development









Blandy lesson plan template adapted from K. Lison

Required information during the PD

Lesson	Animal Adaptations	Planned	
Title		Teaching	
		Date	
Learning Objective			

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)

- 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)

Blandy and Clarke Co. teachers reviewed lesson templates, then modified a lesson template that the teachers already were familiar with.



Model an Activity



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

USDA and Forest Service: Learn about Lichens

"Lichen forest" by jim_mcculloch is licensed under CC BY 2.0

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
- Picture Perfect Science https://www.nsta.org/book-series/picture-perfect-science
- Slides of Teacher Gains https://drive.google.com/dr
 ive/u/0/folders/1sSqdTqbv1JzZPtue7nGspOeBOH
 x-bfQq

Thank you!











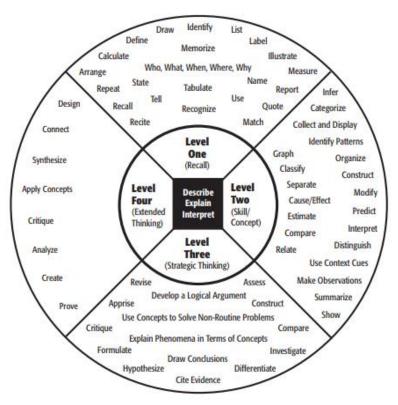
Blandy Education Web Pages &

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



Dept of Knowledge chart shared by New Jersey Department of Education

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

Webb, Norman L. and others. "Web Alignment Tool" 24 July 2005. Wisconsin Center of Educational Research. University of Wisconsin Abadison. 2 Feb. 2006. https://www.ucenurisc.edu/WAT/Index.orgics

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.

Vocabulary

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

<u>Outdoor:</u> 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...

<u>Indoor/outdoor:</u> 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

Technology/Computer Science

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 confettly.

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

Expected student products or learning

-Mandatory: Use of senses other than taste to describe leaves, letter leaf collage -Optional/preferred:
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.

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