From Fear to Fascination: Using Curiosity to Overcome Apprehension

National Children and Youth Garden Symposium

July 13-15, 2022

Lewis Ginter Botanical Garden, Richmond, Virginia

BLANDY EXPERIMENTAL FARM

University of Virginia

Emily Ford

From Fear to Fascination

In this session we will consider how mindset influences learning experience, then engage in an investigation activity intended to transition participants from a potential state of "eew" to a state of observation and appreciation.

<u>Before we get started, please:</u>

Consider: what do YOU hope to get out of this session?

Blandy Experimental Farm

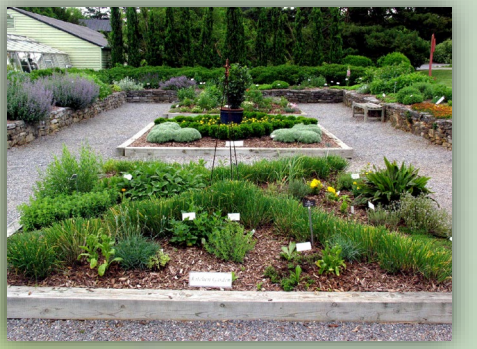
University of Virginia

Field Ecology Research Station

State Arboretum of Virginia

BLANDY
EXPERIMENTAL FARM
University of Virginia

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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Land Acknowledgement

UVA was designed to educate southern white gentle*men*. Built by enslaved laborers, on Monacan tribal land, and enslaved or free Black people provided the labor and capital that supported the students and faculty through the Civil War.
In the early 1900s, the University was a pioneer in the eugenics movement and supported segregated schools.
The education denied to Indigenous nations was publicly acknowledged by what is now recognized as the Commonwealth of Virginia in 2007, yet few institutions have made significant progress on increasing representation of Indigenous students.
We at UVA continue to seek opportunities to engage in meaningful relationship building for our shared futures and acknowledge with respect that we live, learn, and work on the traditional territory of the Monacan Indian Nation. We pay respect to their elders and knowledge keepers past, present, and emerging.
As we engage greater care and sustainable actions in our relations with many Indigenous nations, we invite you to learn more about the Monacan Indian Nation and encourage you to visit the Monacan Ancestral Museum, located just 50 miles from Charlottesville.

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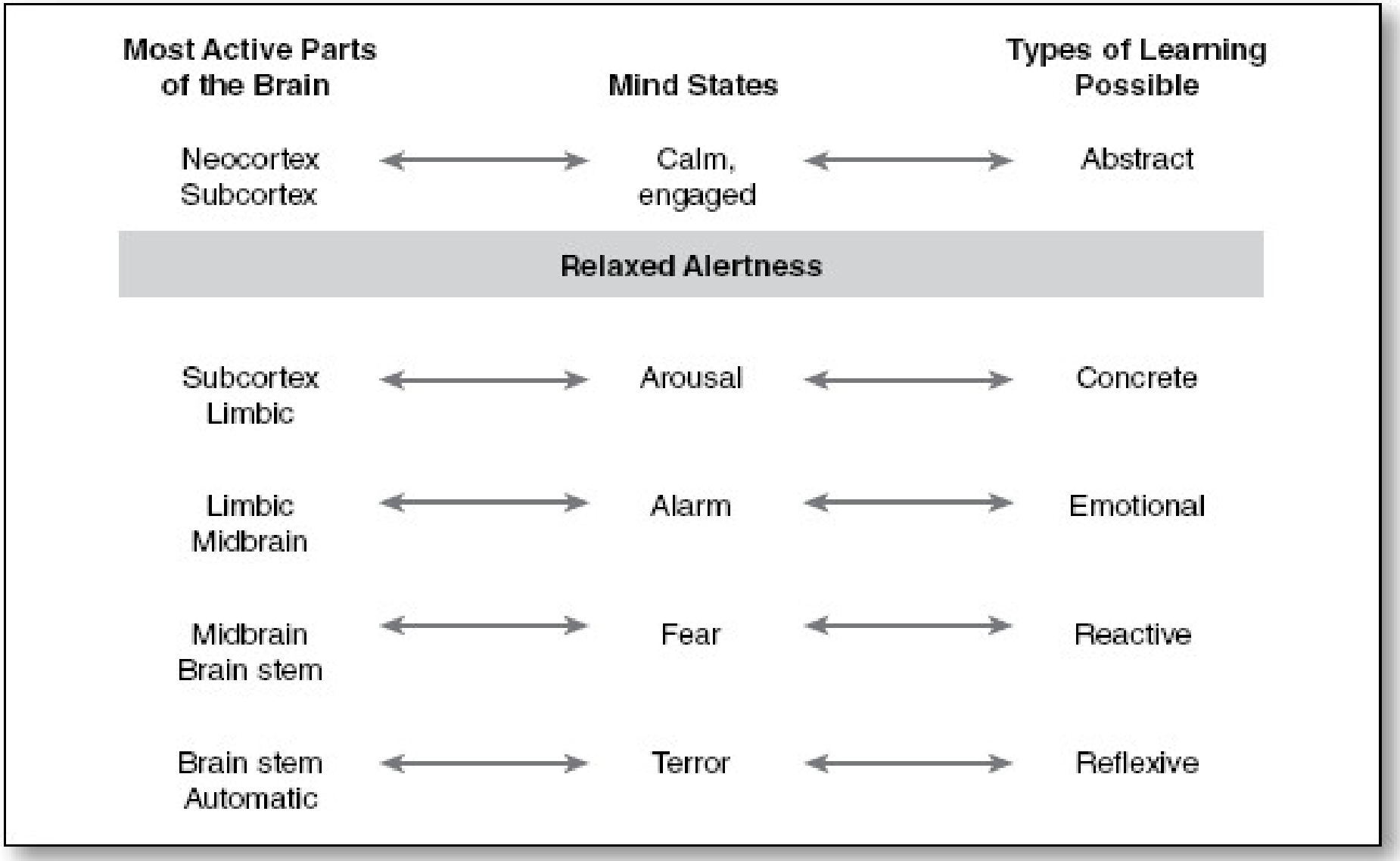
Structure

- Small Group Discussion of a Fear situation
- Observe insects closely
- Compare and Share
- Interdisciplinary Connections
- Applying strategies to your learning habitat
- Wrap up, Growth areas

Figure 3.1 The Effect of Mind States on Learning



(Caine, 2008, p. 39)

"Students who are stressed out or have an

TLDR

Students who are stressed or otherwise emotionally aroused cannot process new information.

successfully in the brain."

Ted Morley

"According to the results of this study, having enough knowledge about insects' biology and ecology can significantly reduce irrational fear and phobia in students.

Therefore, it is recommended to hold some workshops on insects' biology and ecology for students, especially elementary students in order to understand the importance of arthropods in nature and recognize real dangerous arthropods from other beneficial ones.

Moreover, exposure to some insects can also be very helpful in dealing with this issue."

Entomophobia and Arachnophobia Among School-Age Children: A Psychological Approach
Authors: Marziae Shahriari-Namadi[1] , Hamid Reza Tabatabaei[2] , Aboozar Soltani[3], [*]

How would “you” feel arriving in this setting?


ATTACKS
BITES
STINGS
NOPE ROPE
HUNTING ME
DANGER NOODLE
TOXIC
POISON
GERMS

Organism Introduction

- Select an organism.
- Initial Feelings:
  - Share how you feel about the animal.
  - What do you notice about it?
  - Write/record your thoughts.

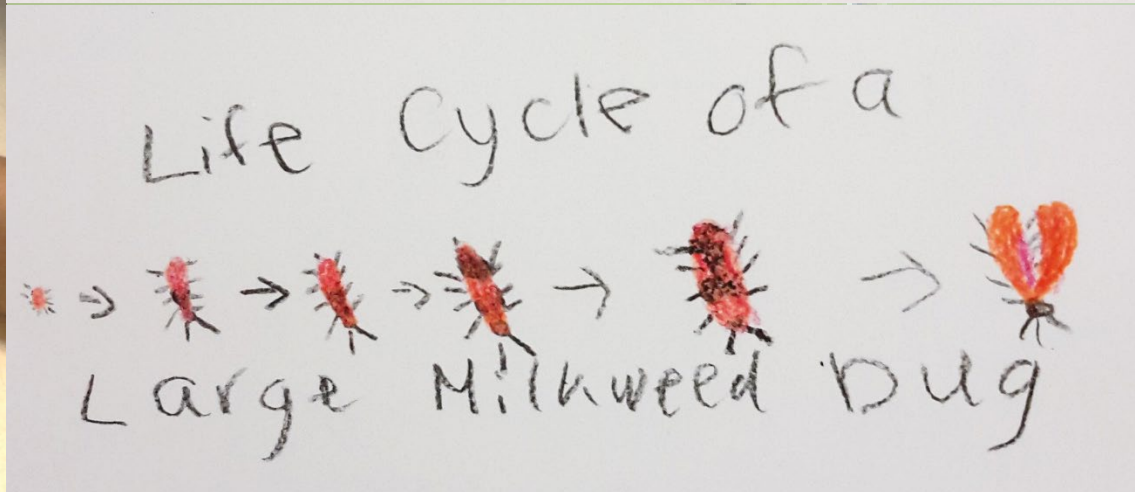
Assignment: Look closely at your non-human animal and put to paper your observations.
Use these tips to help you observe:

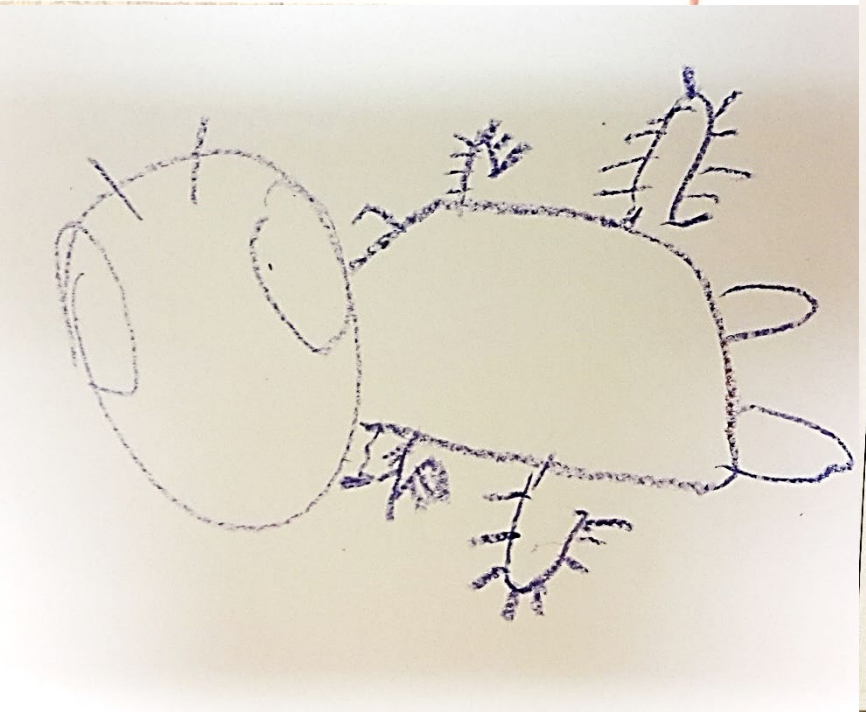
- What do you wonder? Write your questions as you go.
- Why do you think it looks the way it does?
- What do you think this animal eats? Why?
- What do you think its habitat is like? Why?
- How does it move on the ground or in trees or the air? Can it move in more than one way?
- How does it protect itself from predators?

As an educator, think about how this kind of observation could change a student's mindset. Do you feel your own mind shifting through the activity?

Let's Go Outside!

Welcome Back!


Life Cycle of a
Large Milkweed bug



Student Name(s) Kaylynn

Data sheet

Insect name/Type of insect	Draw the insect
Bee	
Do you see pollen on the insect? Where is it located? yes!! on the legs	

Circle the type of mouthpart the insect has.

- Chewing
- Lapping
- ✓ Sucking
- Other?

Draw mouthpart

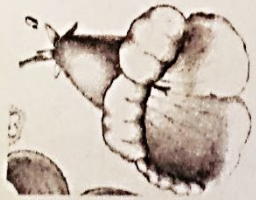
What type of flower do you predict this insect will pollinate?

- Flat and wide open flower

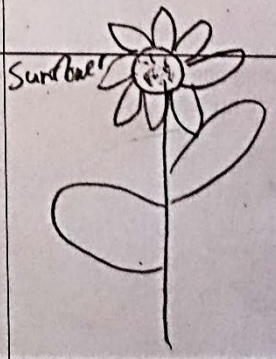
- Short and tube shaped

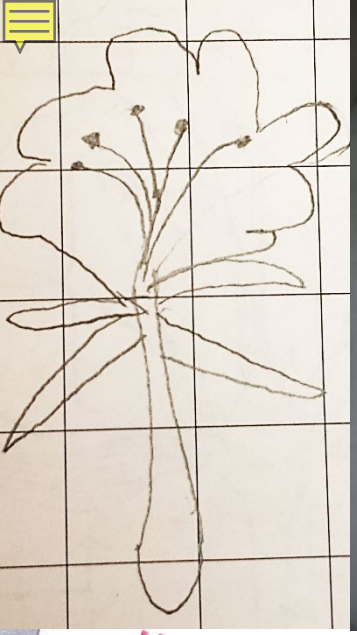
- Long and tube shaped

- A large 'sleeping bag' flower it can climb into



- Draw other ideas





the Bee
Syrest polin
to flower to flower

it grows
in clover

it gros
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the plon
Hoder is
green

it has
100 litle
flowers
in it

A litle
flower

it looks
like a
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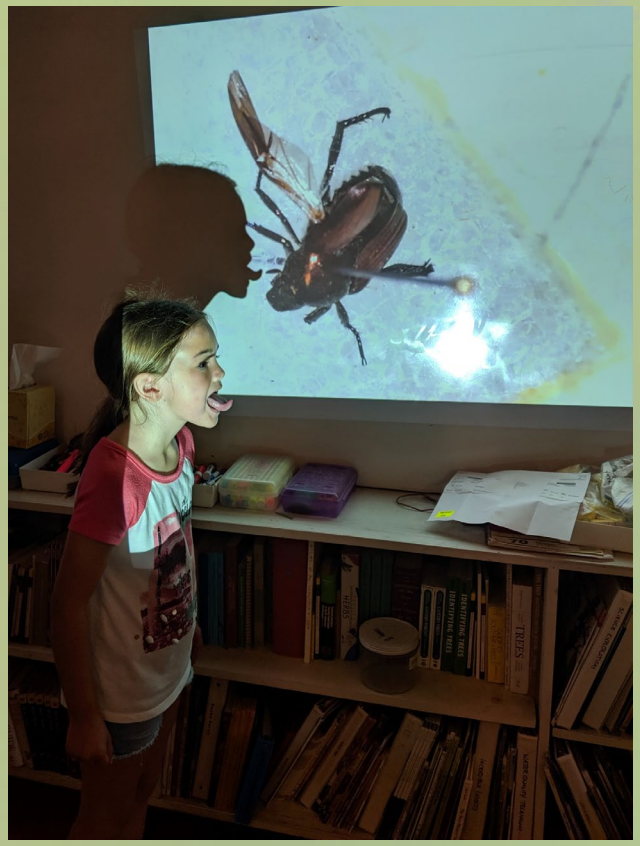
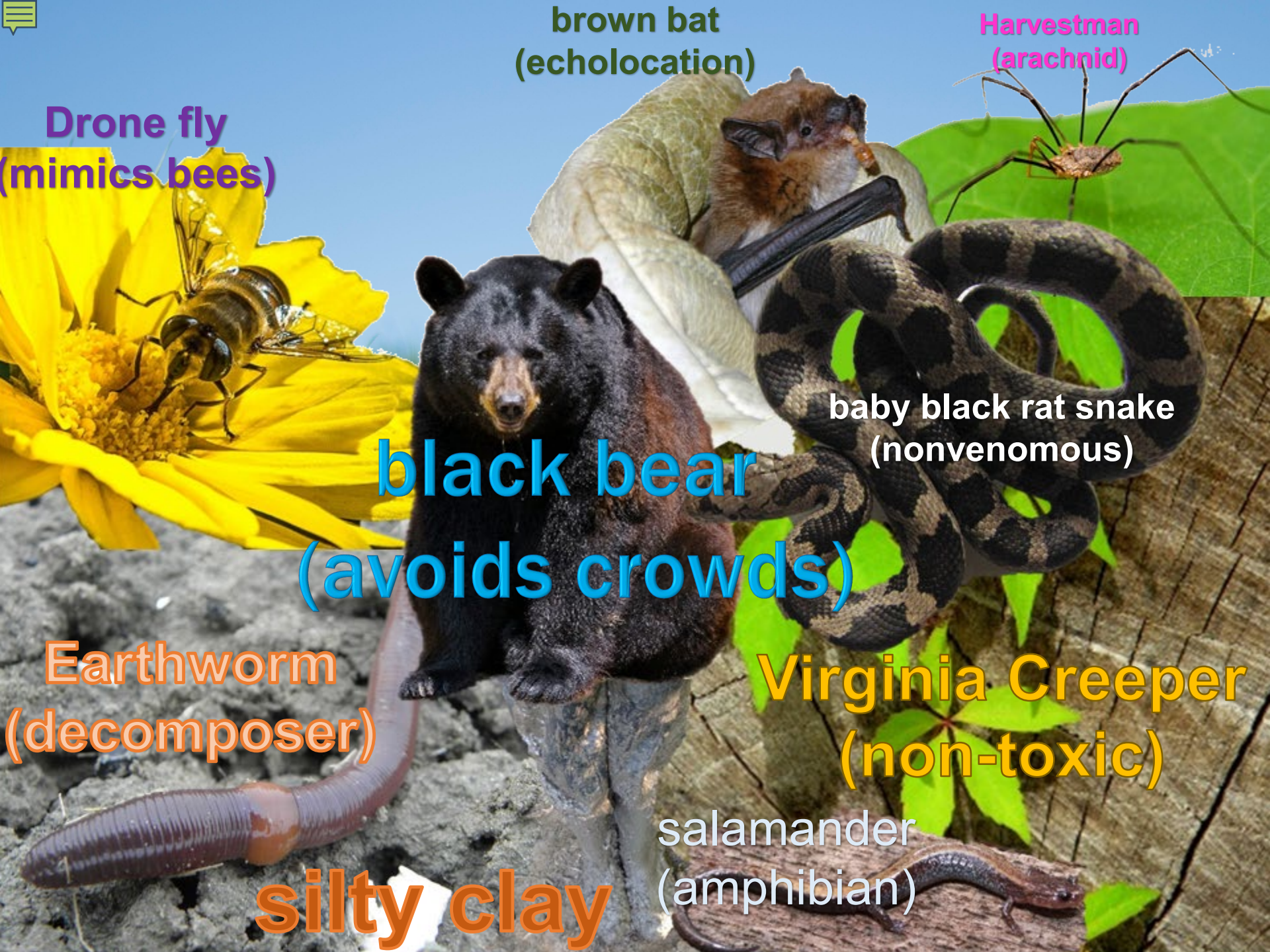
Share your Discoveries.

Did you have any growth from fear to fascination?




brown bat
(echolocation)
Harvestman
(arachnid)
Drone fly
(mimics bees)
baby black rat snake
(nonvenomous)
black bear
(avoids crowds)
Earthworm
(decomposer)
Virginia Creeper
(non-toxic)
salamander
(amphibian)
silty clay

How can you apply strategies we used here in your learning habitat?

Virginia Standards of Learning

Science (2018): 2.1, 3.1, 3.4, 4.1, 4.2, 5.1, 6.1, LS.1, LS.3, LS.7

Visual Arts (2020): 2.5, 2.9, 2.14, 2.17, 3.2, 3.5, 3.14, 4.2, 4.5, 4.8, 4.9, 4.17, 5.5, 5.17, 6.5, 6.7, 6.17, 7.4, 7.6, 7.15, 7.16, 7.17

Next Generation Science Standards

Performance Expectations

From Molecules to Organisms: Structures and Processes

K-LS1-1

1-LS1-1

4-LS1-2

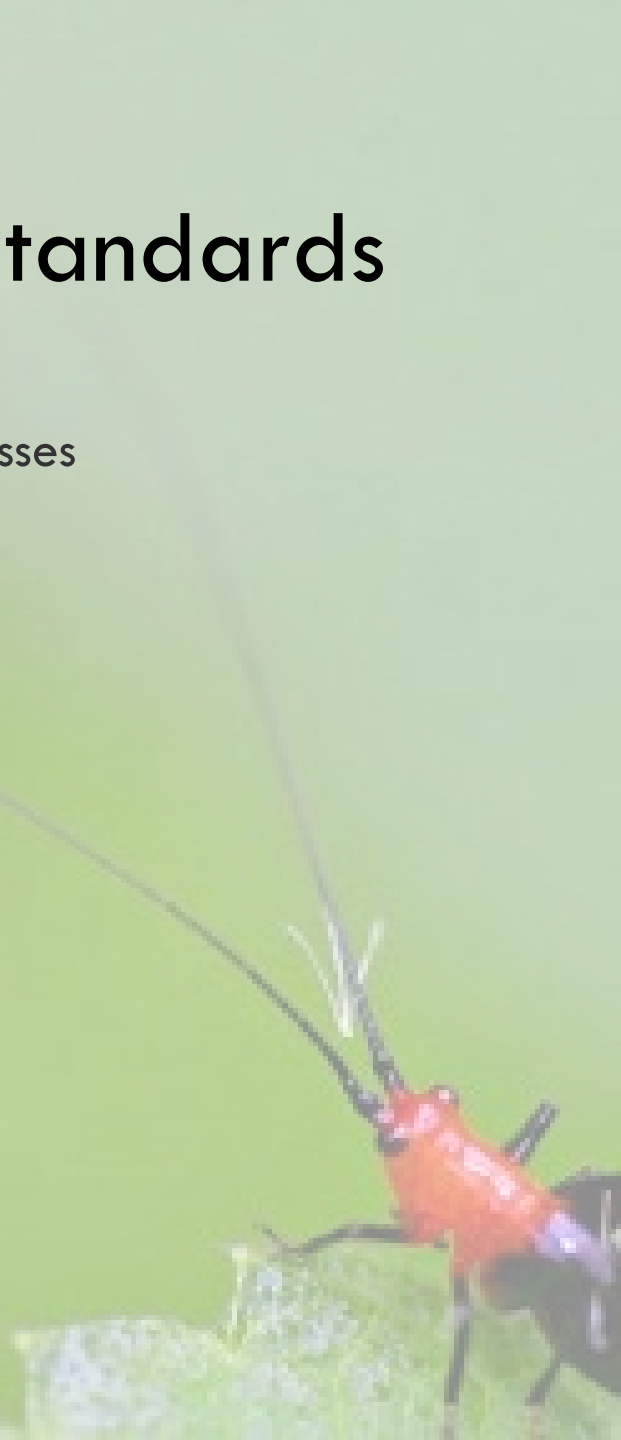
Biological Evolution: Unity and Diversity

2-LS4-1

3-LS4-3

Ecosystems: Interactions, Energy, and Dynamics

MS-LS2-2



Students who demonstrate understanding can:

3-LS4-1. **Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.** [Clarification Statement: Examples of data could include type, size, and distributions of fossil organisms. Examples of fossils and environments could include marine fossils found on dry land, tropical plant fossils found in Arctic areas, and fossils of extinct organisms.] [*Assessment Boundary: Assessment does not include identification of specific fossils or present plants and animals. Assessment is limited to major fossil types and relative ages.*]

3-LS4-2. **Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.** [Clarification Statement: Examples of cause and effect relationships could be plants that have larger thorns than other plants may be less likely to be eaten by predators; and, animals that have better camouflage coloration than other animals may be more likely to survive and therefore more likely to leave offspring.]

3-LS4-3. **Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.** [Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other.]

3-LS4-4. **Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.*** [Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.] [*Assessment Boundary: Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.*]

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices

Analyzing and Interpreting Data
Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

- Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS4-1)

Constructing Explanations and Designing Solutions
Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.

- Use evidence (e.g., observations, patterns) to construct an explanation. (3-LS4-2)

Engaging in Argument from Evidence
Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

- Construct an argument with evidence. (3-LS4-3)
- Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4)

Disciplinary Core Ideas

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

- When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. *(secondary to 3-LS4-4)*

LS4.A: Evidence of Common Ancestry and Diversity

- Some kinds of plants and animals that once lived on Earth are no longer found anywhere. *(Note: moved from K-2)* (3-LS4-1)
- Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3-LS4-1)

LS4.B: Natural Selection

- Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3-LS4-2)

LS4.C: Adaptation

- For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3)

LS4.D: Biodiversity and Humans

- Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)

Crosscutting Concepts

Cause and Effect

- Cause and effect relationships are routinely identified and used to explain change. (3-LS4-2), (3-LS4-3)

Scale, Proportion, and Quantity

- Observable phenomena exist from very short to very long time periods. (3-LS4-1)

Systems and System Models

- A system can be described in terms of its components and their interactions. (3-LS4-4)

Connections to Engineering, Technology, and Applications of Science

Interdependence of Engineering, Technology, and Science on Society and the Natural World

- Knowledge of relevant scientific concepts and research findings is important in engineering. (3-LS4-4)

Connections to Nature of Science

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

- Science assumes consistent patterns in natural systems. (3-LS4-1)

Connections to other DCIs in third grade:

Contact Information

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Resources

- Blandy developed lessons/resources https://blandy.virginia.edu/content/ed-programs-activities-and-lessons
- Caine, R. N. (2008). 12 Brain/mind learning principles in action: Developing executive functions of the human brain. Thousand Oaks, Ca: Corwin.
- Entomophobia and Arachnophobia Among School-Age Children https://brieflands.com/articles/semj-64824.pdf
- Ted Morley https://www.dockwalk.com/jobs/training/how-your-state-of-mind-affects-your-learning

Thank you!

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Blandy Education Web Pages & Resources
https://blandy.virginia.edu/pk-12-education