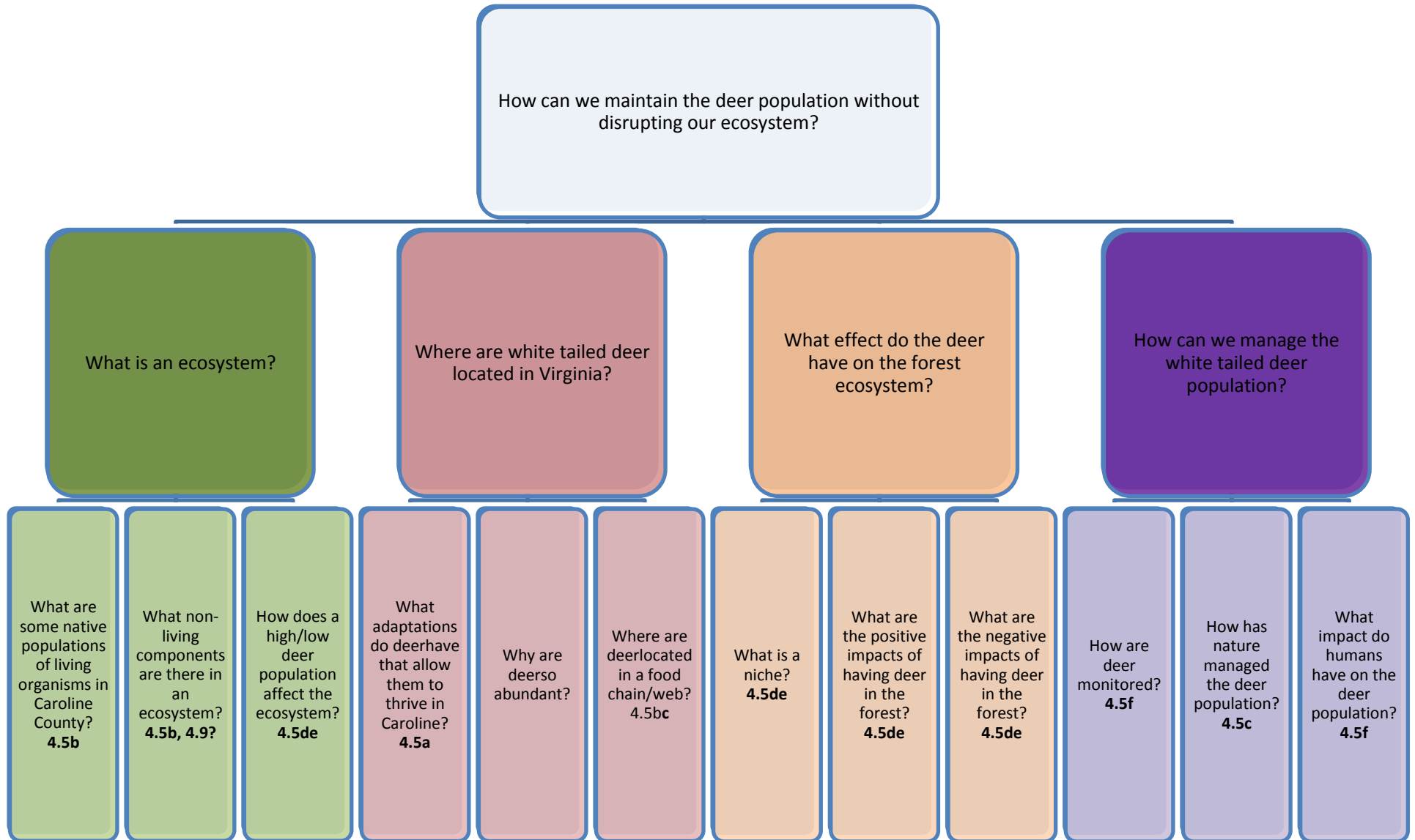# Miya DuBose's Living Systems Question Map

How can we maintain the deer population without disrupting our ecosystem?

What is an ecosystem?

- What are some native populations of living organisms in Caroline County? **4.5b**
- What non-living components are there in an ecosystem? **4.5b, 4.9?**
- How does a high/low deer population affect the ecosystem? **4.5de**

Where are white tailed deer located in Virginia?

- What adaptations do deer have that allow them to thrive in Caroline? **4.5a**
- Why are deer so abundant?
- Where are deer located in a food chain/web? **4.5bc**

What effect do the deer have on the forest ecosystem?

- What is a niche? **4.5de**
- What are the positive impacts of having deer in the forest? **4.5de**
- What are the negative impacts of having deer in the forest? **4.5de**

How can we manage the white tailed deer population?

- How are deer monitored? **4.5f**
- How has nature managed the deer population? **4.5c**
- What impact do humans have on the deer population? **4.5f**

How can we maintain the deer population without disrupting our ecosystem?

What is an ecosystem?

Give students concept "stickies" to organize, in order to guess what they'll be learning.

What are some native populations in Caroline? 4.5b What non-living components are there? 4.5b, 4.9?

Read Butternut Hollow Pond (see red Picture Perfect Science Lessons book) and do some follow up activities linking food chains and food webs (apply that to different types of webs in different ecosystems)

BrainPop Video on Ecosystems

Producer, Consumer, Decomposer Game

Food Chain Game be sure to reiterate that this is too simple. In reality, many different animals eat many-different things. (What do humans eat?)

Review non-living components in our natural forest ecosystem (natural resources)

Where are white tailed deer located in Virginia?

What adaptations do they have that allow them to thrive in Caroline? 4.5a

Wildlife Info: Deer

Review what an adaptation is using **the Habitat Change Keeley Probe** (Blue book Uncovering Student Ideas). Students should think about how soon an adaptation occurs in an animal.

Hands-on: Then have students view deer bones from Project WILD to discover deer adaptations that help them survive.

Why are they so abundant?

Research and discourse: What is it that deer like so much about our area? How does a population grow?

Where are they located in a food chain/web? 4.5bc

Hands-on: Owl Pellets Lesson http://www.enasco.com/product/SB42197B

Create a food web with animals in a forest ecosystem. What are their predators? Where do deer get energy? Have students explore the **Producers and Consumers Game** to learn more about these roles in the food chain. Challenge students to construct a model of their own food chain using paper and pencil, digital tools, or three dimensional objects. Encourage students to label the role of each plant and animal. Students may want to mix up the order of their food chain and have their classmates try to reconstruct it. Be sure to check out our other **science games** in GameUp!

What effect do the deer have?

What is its niche? 4.5de

1. The Jenga tower represents an forest ecosystem. Each block represents one different native species in our ecosystem. Give students specific examples of plants and animals that live in your local ecosystem.

2. Take turns taking one block out at a time. Removing one block represents the removal of one species from your ecosystem. Include reasons why species are removed from ecosystems as the result of natural disturbance and/or human disturbance. Reasons include succession, storms, floods, habitat loss, changing climate conditions, predator/prey relationships, and competition with another species for resources.

3. After you take a native species block out, you must introduce a new species to the ecosystem by replacing a block on top of the tower. Use an invasive species that is of concern in Virginia as your introduced species (example, example, etc.).

   Note: All blocks that are placed on the top of the Jenga tower represent the same species. If you're careful not to knock it down (!), your ecosystem will slowly shift from one that is diverse, to one that has all the same species.

4. Collect data in a table. Keep track of the number of native species you remove, and the number of new individuals you introduce before your ecosystem collapses.

5. Discourse: Ask students to explain what happened. Does this really happen? What happens when a species depletes?

Discourse: Look into the important role deer have in our ecosystem. Have discourse on its place in the food chain, as well as everything else it does in its environment.

Have students think about their role in life right now. Will their role ever change? What animals do we know who's niche changes over its lifetime?

What are the positive impacts? 4.5de

Discourse: We appreciate deer because…

What are the negative impacts? 4.5de

Review: The cultural carrying capacity vs. the biological carrying capacity.

How can we manage them?

How are they monitored? 4.5f

How has nature managed them? 4.5c

Students play **Oh, Deer!**

Discuss other things that weren't taken into account: HD, predators

How do humans impact them? 4.5f

Hunting, car accidents, destroying their habitats.

Deer Kill Data

How does a high/low deer population affect the ecosystem? 4.5de

Check out the Gizmo on Forest Ecosystems.

Give students concept cards to gauge understanding.

Packing a Suitcase Reproducible for INB, as well as study guide

Design a community in which people live and work with the least possible impact on the existing vegetation, wildlife, air quality, water, and soil at the same time that the needs of the people are met as well. CCC vs BCC

Dilemma cards*