GYSTC Discover Georgia STEM Camp
Week Two: Day Two
Title: Helping Others-Taking a Lesson from Nature!
Presenter: Erin Youmans

Purpose:	Animals develop different physical characteristics to help them meet their needs and survive. (adaptations) Humans can design solutions by mimicking how animals use their physical characteristics to help them survive and meet their needs. How can we as humans use the concept of biomimicry to design items that could improve the health industry (a medical device, practice, etc) in the future?
Standard:	S3L1. Obtain, evaluate, and communicate information about the similarities and differences between plants, animals, and habitats found within geographic regions (Blue Ridge Mountains, Piedmont, Coastal Plains, Valley and Ridge, and Appalachian Plateau) of Georgia. a. Ask questions to differentiate between plants, animals, and habitats found within Georgia's geographic regions. b. Construct an explanation of how external features and adaptations (camouflage, hibernation, migration, mimicry) of animals allow them to survive in their habitat. c. Use evidence to construct an explanation of why some organisms can thrive in one habitat and not in another.
Materials:	Paper and pencil (to draw your plan!) Other suggested materials: (not all required) popsicle sticks, pipe cleaners, cups, plastic wrap, duct tape, straws, etc.
Procedures:	Humans can design solutions by mimicking how animals use their physical characteristics to help them survive and meet their needs. *Biomimicry* is a practice that mimics the strategies found in nature to solve human design challenges. Students will engage in the following engineering design challenge: How can we as humans use the concept of biomimicry to design something that could improve the health industry (a medical device, practice, etc)? • Research plant and animal adaptations. • Choose one plant or animal. What is one way that you could improve the health industry by mimicking nature (biomimicry)? • Engage in the engineering design process to create solve the problem! 1. Ask: Think about what you know about health care. Are there things that we can improve? Who has the problem or need?

	Why is it important to solve this problem? Are there any constraints? 2. Imagine: Brainstorm ideas by considering the plant or animal that you selected. Think of how the plant or animal uses its adaptation to survive? What we can we do that is similar? How can we learn from the plant/animal? Choose the best idea. 3. Plan: Develop a plan. Draw a diagram. 4. Create: Gather supplies and build a prototype of your idea. Follow your plan. 5. Improve: Evaluate your prototype. Look for ways to improve your design. Watch the virtual field trip to the Ohoopee River. Look for various plants and animals that live and thrive in the area. Due to the harsh sandy conditions, adaptations allow these certain species to live and thrive there. There are some awesome plants and animals that call the Ohoopee riverine sandhill their home!
Science Behind It:	Adaptation is all about survival. When the environment changes dramatically, some animals die, others move to another location, and some develop adaptations over generations that help them survive. Sometimes the environment changes dramatically due to a natural disaster and sometimes it changes slowly over thousands of years. In each case, over many generations, animals may develop new adaptations to help them survive and thrive. Many different animals have adaptations that protect them from predators. Some of these adaptations are behavioral, allowing them to act a certain way to avoid being seen by a predator. Some adaptions are certain features that allow animals to escape, such as lizards with tails that snap off when a predator tries to capture it. Other adaptations make animals difficult to eat, such as an armadillo. Some animals use camouflage. Camouflage is an adaptation helps a predator to capture food and to allow prey to hide from a predator. Animals also use mimicry. Mimicry is the resemblance of one plant or animal to another. An array of insects mimic other animals and plants in appearance, sounds, or behavior. Hover flies mimic the color of bees or wasps to avoid predators that think they have the potential to sting. Animals develop different physical characteristics to help them meet their needs and survive. Humans can learn from nature and design solutions by mimicking how animals use their physical characteristics to help them survive and meet their needs. *Biomimicry* is a practice that mimics the strategies found in nature to solve human design challenges
Questions to Ask:	What are adaptations? What is mimicry? What is biomimicry?

	What is the engineering design process? How can we learn from nature?