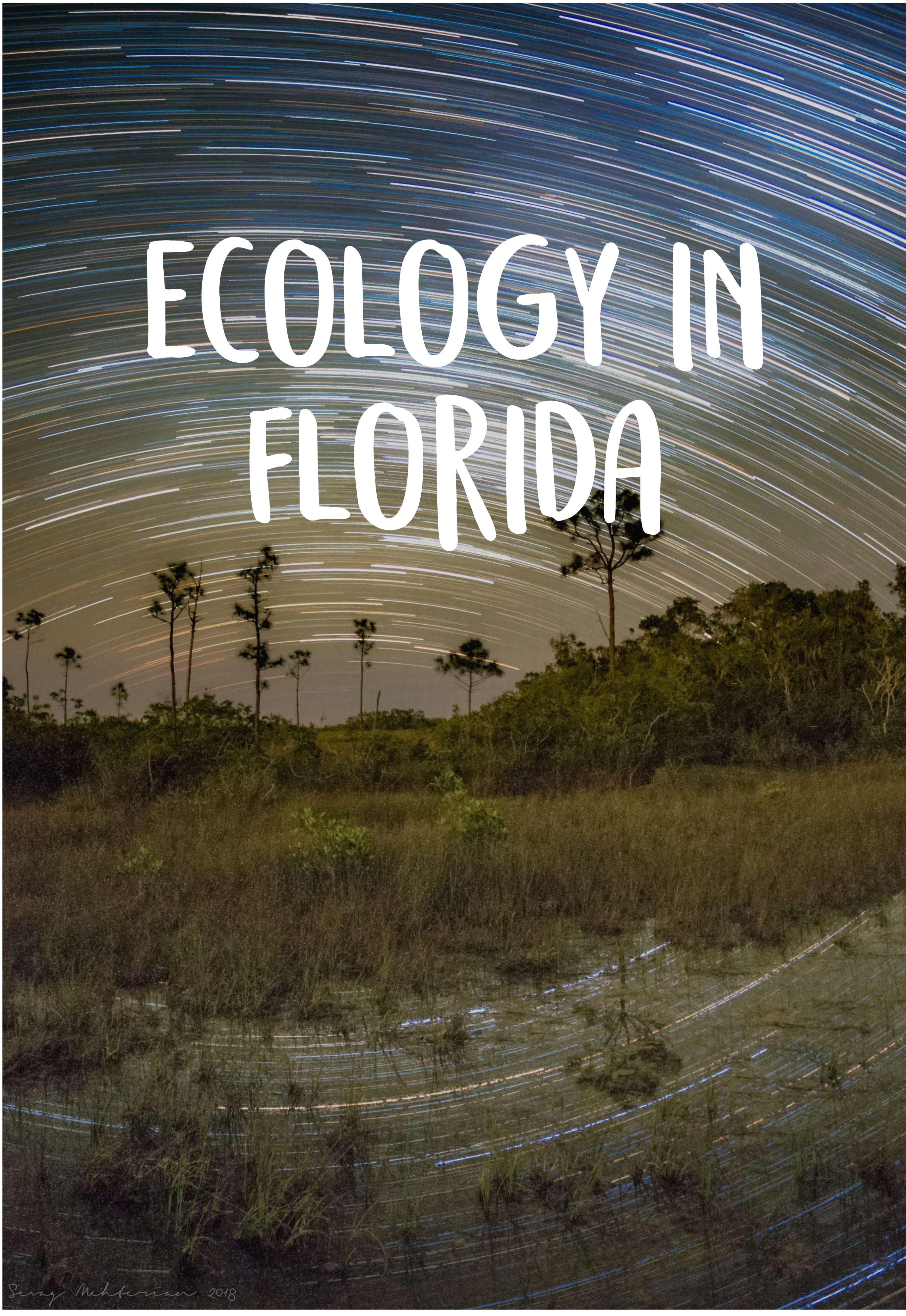
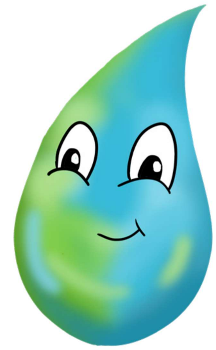
ECOLOGY IN FLORIDA





Florida is an amazingly diverse place, where unique plants, animals, and ecosystems all live together to create the interconnected environment in which we live. We will follow a drop of water, named Billie, on his journey through Florida.

Billie falls as a drop of rain in the upland pine forest before flowing through Florida's freshwater systems, up the majestic St. Johns River and traveling to the coast.

Join Billie the raindrop on his adventures through native Florida as he makes new friends and learn how you can become a Naturalist.

DIVERSITY IN FLORIDA ECOSYSTEMS

OBJECTIVES

SUBJECT MATTER: Students will gain an understanding of ecology, biodiversity, and relationships among ecosystems and species.

LIFE SKILL: Learning-to-Learn & Cooperation

INTRODUCTION ACTIVITY

Just jump right in! This activity is intended to introduce students to the subject; the presentation of content should occur **after** this content.

"TERMINOLOGY TIME": Students will gain familiarity with terminology to provide a common frame of reference for understanding ecology.

PREPARATION: Copy, cut, & laminate the "Terminology Time" activity cards in Appendix A. Depending on the total size of the group, instructors may decide to create 2 sets of cards to accommodate two simultaneous games or provide some team members with more than one term/definition. Activity can be done in any location; estimate 15 minutes for this activity.

STEP-BY-STEP:

1. Students will be divided into two groups. Each team will draw at random 24 cards for playing. Team A will receive the "terms", Team B will receive the definitions. Team A players will line up shoulder-to shoulder facing Team B players who are in a line. (If there is an odd number of students, one student can act as the facilitator). The team should divide their cards out to each individual student.
2. The instructor will facilitate as the two teams switch back and forth with one student from Team A announcing their term and Team B matching the definition. Switch back and forth between Team A and Team B; as A introduces the term and B finds the matching definition. The member of Team B with the correct definition will pair up with the member from Team A. At the conclusion, review any of the terms that students found hard to match and answer any questions students may have.
3. Note: Instructors can utilize this activity at any point during the progression of the curricula. A fun element to add challenge to the students is to incorporate the use of a timer and allow students to "beat their time" each time you meet.
4. Modify this game as needed to match the reading comprehension level of your students. One variation is the instructor reading the definition and teams of students guessing the correct term from the cards. Another option is to spread out all the cards on a table and have students work as a group to "match" the terms and definitions.

TRANSITION: To engage student background knowledge and create interest, transition to the background information by posing a question; for example, "Who would like to share a story about a time you explored nature in Florida."

CAREER CONNECTIONS

WANT TO STUDY NATURE?

There are many careers related to studying nature. Students can explore careers such as biologist, ecologist, conservation scientist, geologist, natural resource specialist, and more.

BACKGROUND INFORMATION

Instructor should spend no more than 10 minutes presenting background content for the lesson. The following information should be used as a guide, along with supplemental resources; it is not a script.

Florida is a fascinating state with a unique natural environment, with a climate ranging from temperate to subtropical, ecological processes such as flooding and fire, and diverse and abundant plant and animal communities. Understanding the complexity of nature is not an easy task, but some basic terminology and concepts can help set the stage for understanding why Florida's plants and animals are so diverse.

Environmental landscapes are a patchwork of **ecosystems.** Ecosystems are defined by the mix of plants and animals and other things such as water and weather that typically occur in an area. So put in a simple way, ecosystems in Florida can be broadly categorized based on where they occur and by the types of living and non-living things that are found there. **Upland** ecosystems are the dryer areas and are described as **terrestrial,** meaning "on land," while **freshwater** ecosystems are the wetter areas and can be either fully or partially **aquatic. Coastal** ecosystems are those areas influenced by ocean waters and tides, which includes both **brackish** (mixed salt and freshwater) and **marine** environments.

All ecosystems on Earth are **interconnected**. A water drop of rain falling in the uplands may feed plants, provide water to animals, and eventually drain into the soil and deposit in the aquifer. This water drop might flow underground before bubbling up in a freshwater spring, providing nutrients to aquatic plants and animals as it drifts down a river. Finally, the same water drop may travel through a brackish estuary as it flows to the coast and into the ocean.

The study of ecosystems is called **ecology.** We study ecosystems to understand the **habitat** requirements and interactions of the **community** of native plant and animal species that live there. A **species** is defined as a group of living organisms that are able to reproduce and produce offspring, such as occurs for green tree frogs, white-tailed deer, and sweetgum trees, as well as thousands of other species of plants and animals that live in Florida. Each species is uniquely adapted to their environment based on what they need and how they get it, which is why different species look and behave differently, eat different things, and live in different habitats.

DIGGING DEEPER

TAXONOMIC CLASSIFICATION

Have students dig deeper to investigate the taxonomic classification of different plants and animals, even humans!

Ecologists develop conservation and management strategies to maintain the environmental conditions to which native species are adapted.

Biodiversity is a complex concept that refers to the variety of life on Earth at all levels, including diversity of genes, species, and ecosystems. Each species has a unique **niche,** or role, in the ecosystem where it lives. Having a diversity of species is important for providing the foods, materials, and medicines that **humans** need to survive. Without a diversity of ecosystems, the Earth would not be able to support the vast number of species that humans rely on.

Biologists study the diversity of species and create **scientific names** with binomial nomenclature (genus and species identifiers) to describe species and define relationships among species. In biological classification, taxonomic rank is the relative level of a group of organisms in a hierarchy; taxonomic ranks are species, genus, family, order, class, phylum, kingdom, and domain. We can also use a **phylogenetic tree** to visualize the relationships among various species based upon similarities and differences in their characteristics.

EXPERIENCE

"TREE OF LIFE": Students will categorize relationships among items, based upon similarities and differences in their physical characteristics.

PREPARATION: The activity can be done in any location where students can move around and form groups. Estimate about 20 minutes for this activity. Gather a box full items that have some shared similarities and some differences among them; provide enough unique items for at least 1 per student (more items are OK too). For example, all leaves but from different plants, all food but different food groups, colors, and textures, all office supplies but different colors, shapes, and type, etc. Provide students with flip chart paper.

STEP-BY-STEP:

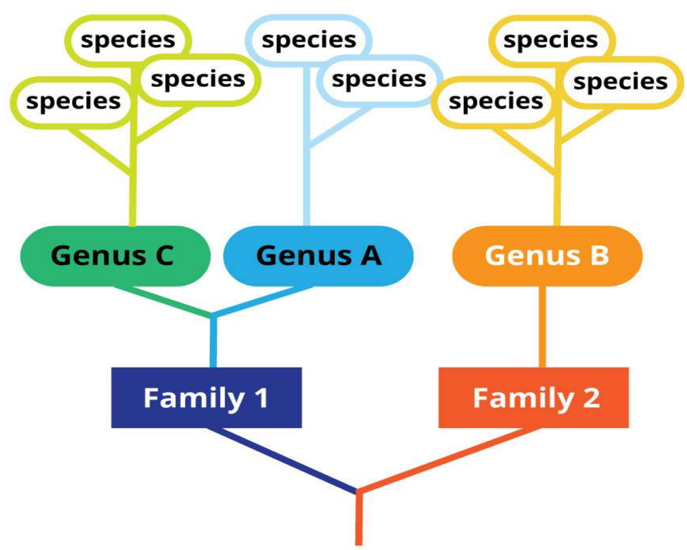
1. Start by allowing each student to pull one item from the box. Once all students have an item, ask them to organize themselves into groups that are "related" based on the characteristics of their items. Ideally, at least 3 groups will form in the class (more if you have a large class). If an especially large group forms (in proportion to your class size), encourage that group to divide up into 2 or more smaller groups.
2. Each student will create a "scientific name" using binomial nomenclature for their item. Each group that formed represents a "genus". Group members will work together to decide on their genus; it should be a unifying trait that is similar among all items in that group (e.g., they are all "Green", or all "Pointed"). Provide each group with a sheet of flip chart paper in order to create their tree of life.
3. Once each small group has decided on their genus, each individual will choose a "species" name for their item. The species name should be something unique about their item that this NOT like any of the other items within their genus group (e.g. "hairy" or "apple"). Each student has now created a scientific name for their item (e.g. "Green apple").
4. Next, each group will select a spokesperson to share with the class what their genus name is and why they chose it. Now the entire class must decide which genus groups should form "families" based on similarity (and differences) of shared characteristics. The instructor should guide the class through choosing a family name for each group of genera (even if there is only 1 genus in the group, it still gets a family name!).

LEAVE NO TRACE

PLAN AHEAD

Know the regulations and special concerns for the area you'll visit. Prepare for extreme weather, hazards, and emergencies. Schedule your trip to avoid times of high use. Visit in small groups when possible. Consider splitting larger groups into smaller groups. Repackage food to minimize waste. Use a map and compass to eliminate the use of marking paint, rock cairns, or flagging.

5. Lastly, the entire class will create a phylogenetic tree to "map out" the relationships among all items, based upon similarities and differences in their physical characteristics. The instructor should facilitate this process throughout steps 3 and 4 using a whiteboard, computer screen, or flip chart. Start by adding each Family, then each Genus, then each item (species) using their new "scientific names."



REFLECTION

Allow 15 minutes total for reflection and application questions.

• When you first picked your item how did you find others with a similar item?

• Was there a logical process that you used to find your group? Why or why not?

• As your group worked together to determine a genus name were there any disagreements? (discuss)

• Was it easier or harder to come up with your individual "species" name?

APPLICATION

Note: Discuss application questions with the whole class after students finish sharing their tracks.

• As you learned new terms like biodiversity and ecosystem how did you feel? Were you confused, excited to learn something new, bored?

• Did you feel confident asking questions to learn more? Are there other times when asking questions will help you learn more about a new subject? (Use this conversation to encourage students to be open minded about learning and trying new things.)

• What are other topics that you'd like to learn more about?

• Are there times when working with a group of people is better than working alone?

SAFETY POINT

PREPARATION!

Before any outdoor exploration, instructors should make sure that all students are prepared in advance, wearing appropriate shoes and protective clothing. Depending on the length of time you plan to explore, consider taking water, snacks, and applying sunscreen. Instructors should also scout the area and check for hazards such as holes, ants, wasp nests, poison ivy, etc.

FIELD JOURNAL ENTRY IDEAS

Provide students with at least 10 minutes to write down their reflections from the lesson in their "field journal"; remind students of key concepts from this lesson and prompts of life skills to think about and reflect on. Additional suggestions are below:

• Write down the new terms you learned participating in the card matching activity.

• Draw your phylogenetic tree in your journal with the "scientific name".

CONGRATULATIONS!

You have completed the ECOLOGY IN FLORIDA chapter!