K-5 Everglades Champion™ Schools

LEADERS' GUIDE

A reference document designed to support the K-5 Everglades Lead Teacher(s).

WWW.EVERGLADESLITERACY.ORG

Dear Everglades School Leader(s),

Welcome to the K-5 Everglades Champion Schools Program! The **Everglades Champion Schools Program (ECSP)** is an exciting interdisciplinary program developed by The Everglades Foundation that showcases and recognizes Florida schools that demonstrate exceptional Everglades efforts and initiatives each year. The goal of the program is to engage and empower a school's community to become stewards of the River of Grass. Success in the program utilizes involvement from teachers, students, administrators, community partners, parents, and others.

An Everglades Champion School is filled with individuals eager to learn about the Everglades and how to conserve it. Your school will become an Everglades Champion School by completing an application and documenting how your school addresses different categories and indicators from the Champion Schools Evaluation Criteria. You may earn points by integrating Everglades education into the classroom through lesson plans, projects, field experiences, and developing a culture of Everglades stewardship within the community. We have created this K-5 Everglades Champion Schools Leaders' Guide as a reference guide designed to support your Everglades Lead Teacher contacts that were submitted on your Program Commitment Form.

If you have any questions, I would be happy to assist you. I look forward to hearing from you—and working together on behalf of your students and the Everglades!

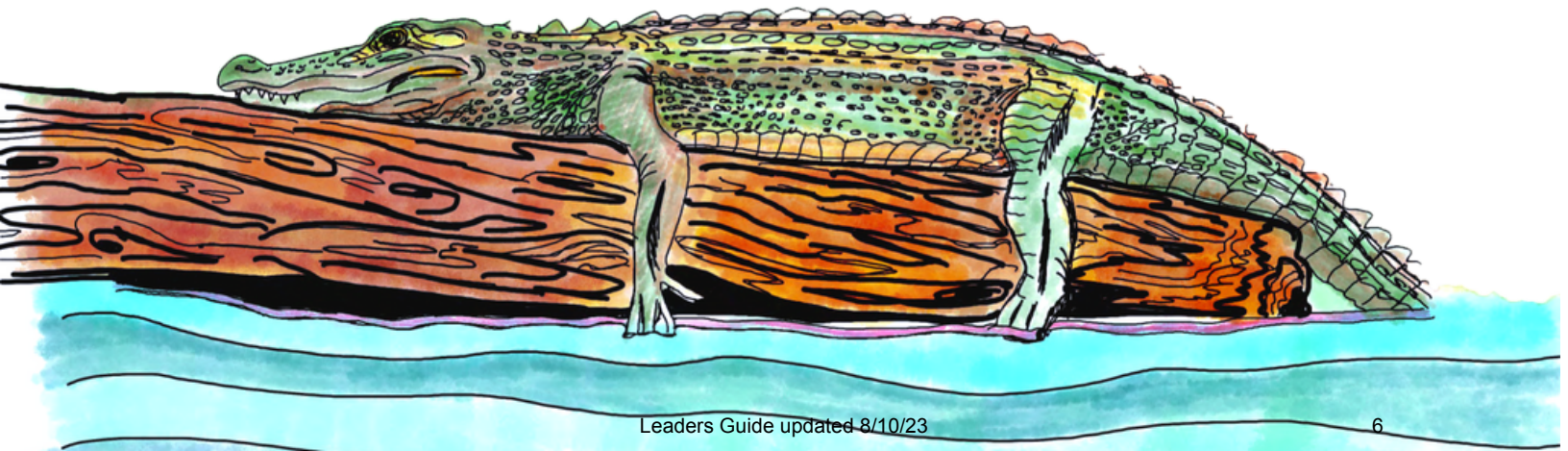
Cordially,

Alicia Torres
K-12 Everglades Champion Schools Program Manager

The Everglades Foundation
Office: 561-233-9004
Email: atorres@evergladesfoundation.org

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT.)



The Everglades Foundation™

is a 501(c)(3) non-profit organization committed to restoring and protecting the Everglades. Founded in 1993 by two outdoor enthusiasts — the late George Barley and Paul Tudor Jones II — The Everglades Foundation works tirelessly to bring people together and provide a powerful voice for Everglades restoration at the state and national levels.

Today, The Everglades Foundation stands as a well-respected authoritative source for scientific research on the Everglades. Our renowned scientists are passionate researchers, dedicated to providing sound science and practical analysis to help local, state, and national leaders make well-informed decisions. By coupling sound science with policy expertise, the Foundation is positioned as one of the most influential players in the fight to restore and protect one of the world's most unique wetlands.

MISSION AND VISION STATEMENTS

The Everglades Foundation works to protect and restore America's Everglades through science, advocacy, and education.

We envision an Everglades with abundant freshwater for consumption, enjoyment, ecological health and economic growth for generations to come.

Learn more on the website - www.evergladesfoundation.org

Getting Started in the Program

The K-5 Everglades Champion Schools (ECS) Leaders' Guide is designed to support the appointed Everglades Lead Teacher contacts, like yourself, that were submitted on your Program Commitment form. This tool encompasses program details, resources, and quick reference sheets to guide you through the steps to complete the K-5 Everglades Champion Schools Application process and become a recognized bronze, silver, or gold-level Everglades Champion School.

Your Role as the Everglades Lead Teacher(s)

- Lead your Everglades School Team as the designated liaison representing your school for the ECS Program.
- Remain in contact with the ECS Program Manager for program support.
  - 1-to-1 Program support meetings are available - Contact K-12 Champion Schools Program Manager, atorres@evergladesfoundation.org
- **Complete the ECS Application & Upload Documentation by the May deadline (usually the 2nd Thursday of the month).**
- Receive the ECS monthly newsletters/emails and distribute information to an appropriate audience within your school community.
- Attend the Virtual Celebration of Champions Recognition Event (June).
- Receive and distribute Champion School recognition materials for your school (August/September).

What's Next?

01 Start by formulating an Everglades School Team. We encourage your team to include one teacher from each grade level and an administrator, but it should include **two lead teachers and one supporting administrator at a minimum.**
  - Discuss your school goals, how you will address the categories of the Evaluation Criteria, and your school's implementation plan for the program.

02 Download/Print out the full version of the **Evaluation Criteria** from our website (see QR code or PDF at the end of this document).

What are the Evaluation Criteria?

The Evaluation Criteria are an objective set of measures and are based on a point system for the categories and indicators of the program. Schools can earn points for each of the following four categories towards becoming a bronze, silver, or gold-level Champion School.

I. Professional Development
II. Integrating Everglades Literacy into the Curriculum
III. Everglades Community & Culture
IV. Everglades Extensions: Above and Beyond

Under each category are indicators or sub-categories that identify how schools may specifically earn points for each category. The ultimate goal is to see school-wide involvement so that the whole school sees themselves as an "Everglades Champion School".

K-5 Evaluation Criteria: At-A-Glance

Category	Possible Points	Indicators		
I. Professional Development	40*	A. Everglades Literacy Teacher Trainings (30 points) + (5 bonus points*)	B. Additional Environmental Trainings (10 points)	
II. Integrating Everglades Literacy into the Curriculum	50	A. Everglades Literacy Teacher Toolkit Implementation (30 points)	B. Everglades Interdisciplinary Approach (10 points)	C. Field Experiences (10 Points)
III. Community & Culture	30	A. Everglades Student Ambassadors (10 points)	B. Community Partnerships (10 points)	C. School Culture (10 points)
IV. Everglades Extensions	10	Judges may award up to 10 points for Everglades initiatives that have gone above and beyond the scope of the other categories, or for initiatives that do not fit neatly elsewehre.		
Total	**130**	(+5 if bonus points are awarded)		

What 2 Indicators are Required?

Although you may not be able to achieve points for every indicator, there are <u>two indicators that are mandatory</u> as they are the foundation for the Everglades Champion Schools Program: **Everglades Literacy Teacher Trainings (I.A)** and **Everglades Literacy Teacher Toolkit Implementation (II.A).**

A. Everglades Literacy Teacher Trainings (30 points) + (5 bonus points*)

A. Everglades Literacy Teacher Toolkit Implementation (30 points)

Accessing Your Application

Each school is responsible for submitting a Champion Schools Application by the deadline date set in May. **The application questions directly align to the categories and indicators described in the Program's Evaluation Criteria.** The application should be an ongoing collection process throughout the school year. **Proper documentation of your efforts will be required to support this application.**

Access your application with the following steps:

01 Go to our education website: www.evergladesliteracy.org.

02 Click on the "Champion Schools" tab located in the top toolbar.

03 Click on the K-5 icon.

04 Look for Step 3: "Fill out the Application" and click on "Apply Now". By this point, you have already completed steps 1 and 2.

05 **The first time that you try to access the application**, you will be prompted to create a profile (or register) with a first and last name followed by an email address. When you register your profile, it should be with the lead teacher contact that is primarily responsible for entering information on the application.

***Remember your password. We won't have access to the password you created.*

06 Click on "View Forms".

07 Select this year's "K-5 Everglades Champion Schools Application"

08 Click "Apply" to start your application.

Tip:
Set a password that you don't mind sharing with other members of your team that will be helping you complete the application. They will need to use your login information to see your draft application.

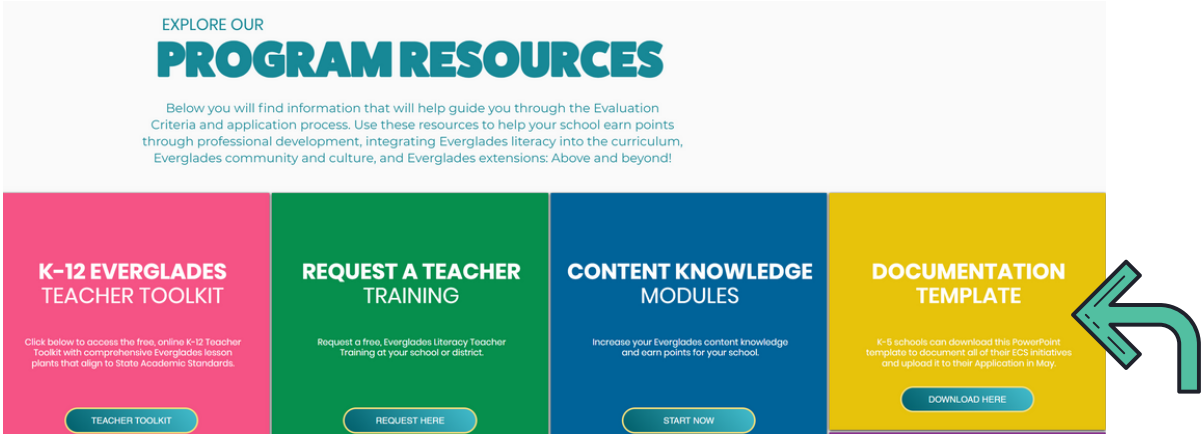
09 Answer all of the questions to the best of your ability. If questions or fields are not applicable, enter N/A. Don't forget to save your work!

- *Keep the application in DRAFT form until you are ready to submit your completed application.*

10 Utilize the navigation sidebar on the application to see your progress.

Uploading Documentation With Your Application

Tip: Download the ready-to-use Documentation Template from Program Resources section. It is already set up with proper section headings.



In order for our panel of judges to award points for each of your Everglades initiatives and efforts included on your application, **it is required to have documentation submitted**. Missing documentation may result in the loss of points that could have been awarded.

Documentation helps paint a picture of the Everglades initiatives at your school. Please provide concise details that accurately describe or support your initiatives.

- If there are multiple forms of documentation that are being uploaded, **please label each uploaded document** to correlate to the grade level or activity described on the application.

- If you include **external links** or **videos**- make sure that your settings permit viewing outside your school network ("Anyone can view").

- Choose the best images or forms of documentation that portray your initiatives **and caption your photos.** Multiple examples of the same student work do not need to be included. We love seeing images that capture student engagement and student work.

Examples of documentation are provided in the Evaluation Criteria.

In the event that you are having trouble accessing your application, please notify the Champion Schools Program Manager, Alicia Torres at: atorres@evergladesfoundation.org

Submission & Celebration

When to Submit Your Application?

Applications need to be submitted by 11:45 pm on the deadline date identified as **the 2nd Thursday of May** for each school year.

Application Checklist before Submitting

- [ ] Double-check the spelling of your school name and address provided in your application. This information will be printed on all recognition materials.
- [ ] Double-check all your fields in your application prior to submission for accuracy and completeness.
- [ ] Utilize the navigation sidebar on the application to make sure all have a checkmark for completion.
- [ ] Upload proper documentation for each category. If external links are provided, change all settings to permit other people outside your organization to view them. *Any links that are not accessible by our judges will not be considered for your evaluation.*
- [ ] Once your application is completed, select "Submit" your application.

What Happens After You Submit Your Application?

- You will receive a confirmation email that acknowledges your application submission.
- Our panel of Everglades judges will review your application, and determine your school's final score. The level of recognition - bronze, silver, or gold - is determined by the amount of points earned.
- You will receive an invitation to attend our Virtual Celebration of Champions Recognition Event (June) where recognition levels for participating schools will be announced.

Virtual Celebration of Champions Recognition Event

We will celebrate all our schools' successes together and recognize schools as **bronze, silver, or gold-level** K-5 Everglades Champion Schools at our Celebration of Champions event in early June. We would hope that at least one representative from your school would attend the K-12 Celebration of Champions Recognition Event. Notifications of your level or recognition will also be shared after the event to your principal, and Everglades leaders. Special awards will also be announced at this event.

When will our school receive Champion Schools branded recognition materials?

The Everglades Foundation will ship or deliver your recognition materials to your provided school address by August/September.

Post-Program Survey

Following the Recognition Event, you will receive a request to complete a post-program survey. Your input is valuable to us to help us improve and better support participating Champion Schools in the future.

K-5 Everglades Champion™ Schools

QUICK REFERENCE SHEETS

Category I. Professional Development
- A. Everglades Literacy Teacher Trainings
- B. Additional Environmental Trainings

Category II. Integrating Everglades Literacy into the Curriculum
- A. Everglades Literacy Teacher Toolkit
- B. Everglades Interdisciplinary Approach
- C. Everglades Field Experiences

Category III. Everglades Community and Culture
- A. Everglades Student Ambassadors
- B. Community Partnerships
- C. School Culture

Category IV. Everglades Extensions: Above and Beyond

Category I: Professional Development

THERE ARE 2 INDICATORS FOR THIS CATEGORY:

Category	Possible Points	Indicators	
I. Professional Development	40*	A. Everglades Literacy Teacher Trainings (30 points) + (5 bonus points*)	B. Additional Environmental Trainings (10 points)

A. Everglades Literacy Teacher Training

The first indicator, Everglades Literacy Teacher Training, is the foundation for the Everglades Champion Schools Program. This professional development is provided by The Everglades Foundation to build a school's Everglades literacy capacity as a way to ensure that all Florida students understand the importance of the Everglades.

IN ORDER TO BE CONSIDERED AN EVERGLADES CHAMPION SCHOOL, AT LEAST TWO TEACHERS IN YOUR SCHOOL ARE REQUIRED TO ATTEND A TRAINING.

Types of Training

We offer this training throughout the school year either face-to-face or virtually scheduled as a whole school training or an off-campus training.

- Time allotted for virtual training: 3 - 6 hours (varies by district requirements).
- Time allotted for face-to-face trainings: 4-6 hours (varies by requests).

Requesting an Everglades Literacy Teacher Training

- Option 1: Complete this request form from our website at https://www.evergladesliteracy.org/get-involved
- Option 2: Inquire training information by contacting an Education Team member.

Documentation for Everglades Literacy Teacher Trainings

Documentation for Indicators I.A. should derive from the Professional Development Records spreadsheet provided by The Everglades Foundation Education Team. Your Professional Development records contains an extensive list of all teachers that have historically been trained from your school.

You will need to review and identify if teachers are currently at your school. We will change the text to red if teaches are no longer at your school, or a duplicate record is found. Only count the teachers that are currently at your school on your application.

Screenshots of your spreadsheet can be used as sufficient documentation for your Champions Application.

EXAMPLE: PD Records spreadsheet that EF provides:

A	B	D	E	F	G	H	I
First Name	Last Name	School	County	Grade Taught	Subject	Workshop Date	Training Type
Alli	Gator	EF Elementary	Palm Beach	3rd grade		5/25/2023	K-5
Bob	Catty	EF Elementary	Palm Beach	2nd grade		5/25/2023	K-5
Pan	Ther	EF Elementary	Palm Beach	Kindergarten		5/25/2023	K-5
Rose	Spoony	EF Elementary	Palm Beach	5th grade		5/25/2023	K-5
Blue	Heron	EF Elementary	Palm Beach	5th grade		5/25/2023	K-5
Ann	Hinga	EF Elementary	Palm Beach	1st grade		5/25/2023	K-5

B. Additional Environmental Trainings

The second indicator, Additional Environmental Trainings, while not mandatory, allows schools to earn points for any teachers, administrators, or staff that attends any in-person or virtual workshops, trainings, modules and/or conferences that focus on the Everglades or additional environmental topics. Your school can earn up to 10 points for this indicator.

Tip: Any trainings that are completed the summer leading up to the current school year can be applicable. **For example,** if you attended our Annual Everglades Teacher Symposium over the summer then you may apply it under this indicator.

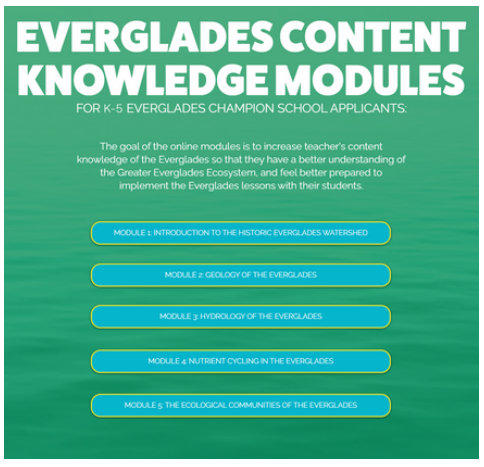
To assist in seeking out these additional trainings, Everglades Content Knowledge Modules are available on our website via Program Resources. They are independent, self-paced online professional development opportunities developed to increase teachers' content knowledge about various topics of the Everglades.

Module topics to choose from:

- Module 1: Introduction to the Historic Everglades Watershed
- Module 2: Geology of the Everglades
- Module 3: Hydrology of the Everglades
- Module 4: Nutrient Cycling in the Everglades
- Module 5: The Ecological Communities of the Everglades

These modules can be completed in any order by any teachers or administrators at your school whether or not they have attended an Everglades Literacy Teacher Training. **Points are earned when teachers have a passing score of 60/80 (75%).**

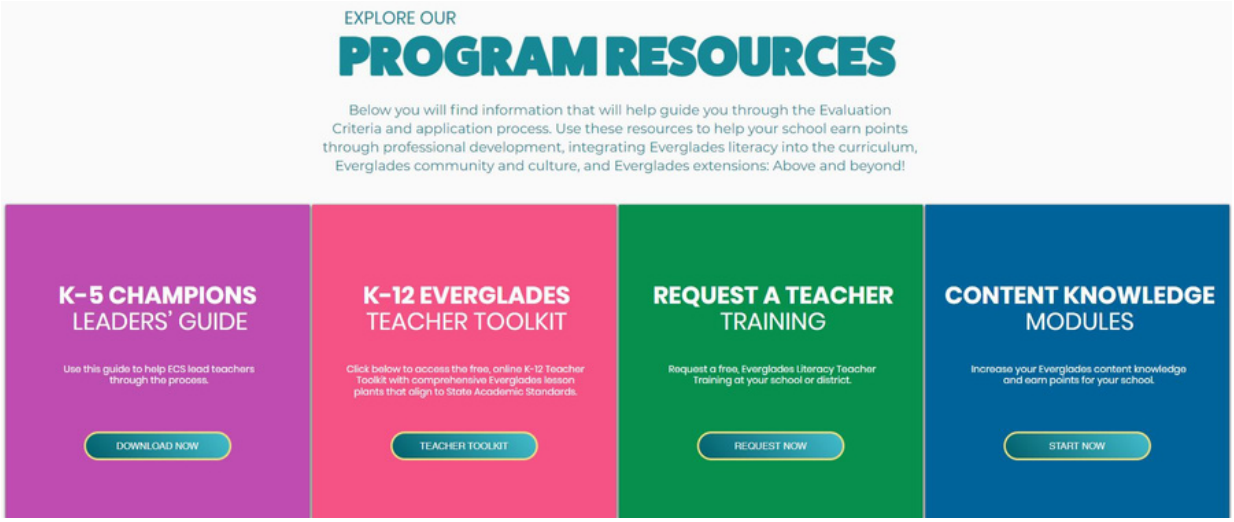
Plan strategically for this indicator because module points can only be applied in the year in which they are completed and cannot be ones completed in prior years.



Accessing the Modules

- Go to our website: www.evergladesliteracy.org
- Click on “Champion Schools” located on the toolbar.
- Select “K-5 Champions” from the dropdown menu.
- Scroll down to the K-5 "Program Resources."
- Click on "Start Now" located in the Content Knowledge Module section.
- OR visit www.evergladesliteracy.org/content-modules

**Tip:* *Print the module’s Guiding Questions before starting each module.*

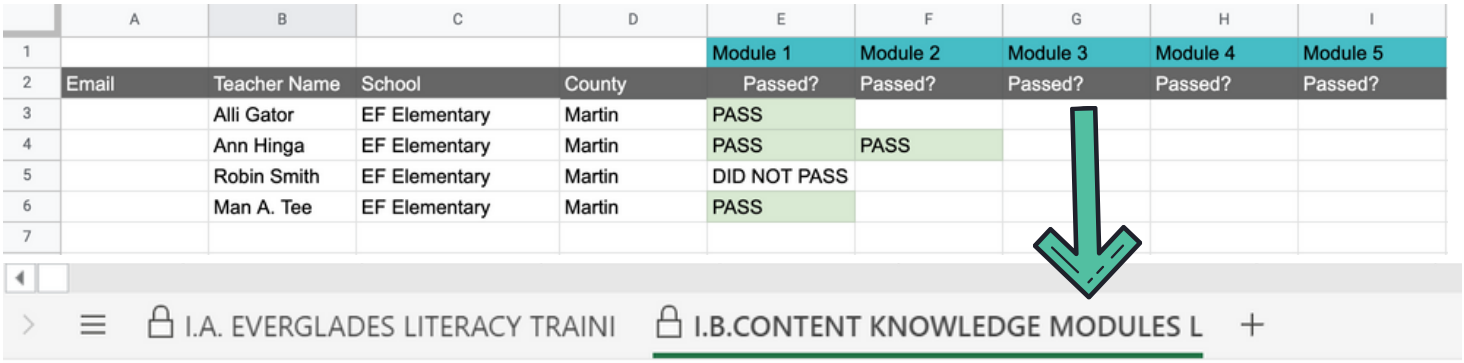


Documentation for Content Modules

If Content Modules have been completed, you can view all historical and current records via the Professional Development Records spreadsheet provided to you from The Everglades Foundation Education Team.

Open Spreadsheet Link > Click on Tab 2 labeled I.B Content Modules to view the pass/fail records for each of the teachers. Screenshot the spreadsheet, and any other certificates for documentation.

PD Records spreadsheet that EF provides:



	A	B	C	D	E	F	G	H	I
1					Module 1	Module 2	Module 3	Module 4	Module 5
2	Email	Teacher Name	School	County	Passed?	Passed?	Passed?	Passed?	Passed?
3		Alli Gator	EF Elementary	Martin	PASS				
4		Ann Hinga	EF Elementary	Martin	PASS	PASS			
5		Robin Smith	EF Elementary	Martin	DID NOT PASS				
6		Man A. Tee	EF Elementary	Martin	PASS				
7									

Category II: Integrating Everglades Literacy into the Curriculum

THERE ARE 3 INDICATORS FOR THIS CATEGORY:

Category	Possible Points	Indicators		
II. Integrating Everglades Literacy into the Curriculum	50	A. Everglades Literacy Teacher Toolkit Implementation (30 points)	B. Everglades Interdisciplinary Approach (10 points)	C. Field Experiences (10 Points)

A. Everglades Literacy Teacher Toolkit ™ Implementation

Implementation of the Everglades Literacy Teacher Toolkit is the second of the **two required indicators**. It is required that your school implement these lessons with, at a minimum, 20% of your total student population.

The Teacher Toolkit offers:

- 3 lessons for each grade level aligned to the K-5 Next Generation Sunshine State Standards and B.E.S.T standards.
- Provides downloadable PowerPoints, student sheets, and rubrics.
- Lesson plans that introduce students to key aspects of the Everglades ecosystem.

Points are awarded based on the percentage of the total student population who have <u>completed the three lessons for their grade level.</u> Toolkit lessons can be implemented by any trained or untrained teachers at your school.

Accessing the Everglades Literacy Teacher Toolkit

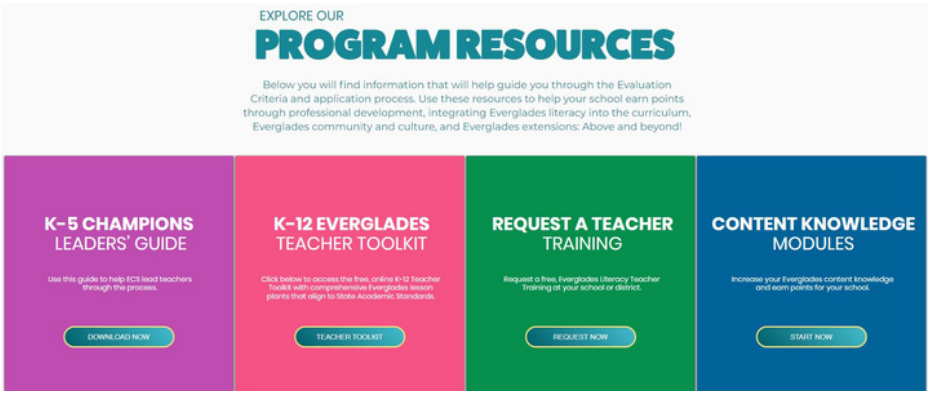
Use the following quick link: https://www.evergladesliteracy.org/teacher-toolkit

OR

- Go to our website: www.evergladesliteracy.org
- Click on "Teacher Toolkit" located on the toolbar.

OR

- Find the K-12 Teacher Toolkit in the K-5 Champions Program Resources



- Scroll down to the K-12 Curriculum and click on the appropriate grade level.
- Download and print (if necessary).

Request for Lesson Supplies

We don't want the materials for each of the lessons to be an obstacle from implementing our lessons with your students. You may contact a member of the Education Team to request grade-level materials to be shipped to your school.

Scan the QR code below to fill out the
Everglades Literacy Materials Request Form

**Please give at least 2 weeks' notice in order for our team to prep and ship.*

B. Everglades Interdisciplinary Approach

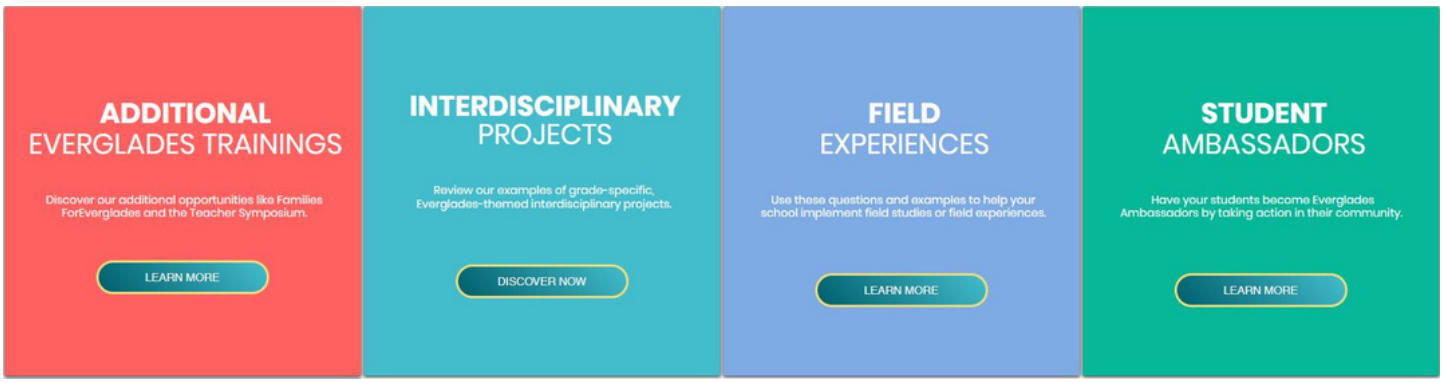
The purpose of this indicator, Everglades Interdisciplinary Approach, while not mandatory, is for educators to integrate Everglades projects/lessons across multiple disciplines or subject areas that focus on Everglades conservation or help students build upon and enhance awareness of the Everglades.

The Champions Program would like to see at least **1 Everglades-focused interdisciplinary project/lesson be implemented at each grade level**. Your school earns more points for the number of students participating. If a grade level implements more than one per grade level, then those additional efforts should be included in ***Category IV. Everglades Extensions: Above and Beyond*** because your school went beyond the scope of this indicator.

Tip: Teachers may use 6-12 grade Everglades Toolkit Lessons, modify it to be interdisciplinary, and implement it with their students for this indicator. They can not be from the K-5 Teacher Toolkit since that is classified under the first indicator of this category.

The possibilities are endless for this indicator but we've provided some project examples for each grade level on our website to get the creative juices going.

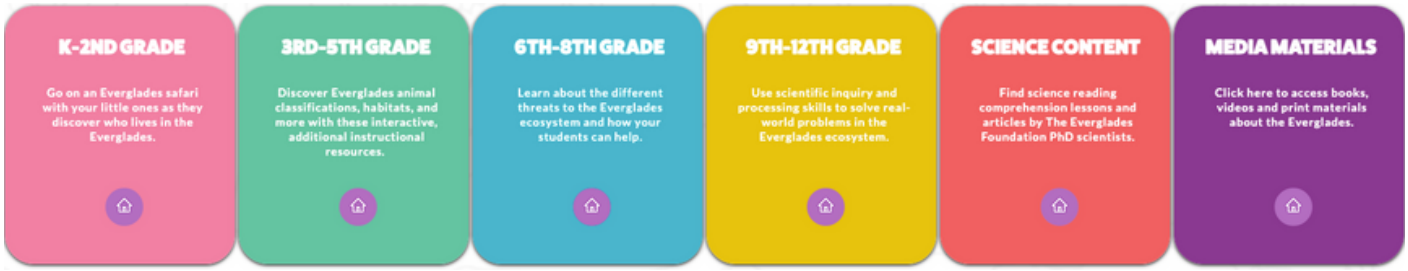
- Go to: https://www.evergladesliteracy.org/k-5-champions
- Scroll down to the "Program Resources".
  - Click the section titled "Interdisciplinary Projects"



- You may download or view it as a PDF that contains Interdisciplinary examples.

Additional Instructional Resources

Our Additional Instructional Resources are bite-size, interdisciplinary lesson plans, videos, and activities, that are a great starting point for this indicator. Many of these lessons have been adapted from the Teacher Toolkit, and aligned to Next Generation Sunshine State Standards.



C. Everglades Field Experiences

For the third indicator, Field Experiences, while not mandatory, students learn about the Everglades through guided first-hand observations and/or investigations that allow ***students to collect data in the field*** or outdoors like their local environments including your school grounds or natural areas.

Alternative option: We have a great set of virtual field experiences from Odyssey Earth, complete with student data sheets, and field guides on our website that can be used as a engaging activity or in preparation to a field trip.

Start your Interactive 360-degree virtual field experiences here:

Like **Indicator II.B**, the point structure is also based on the percentage of students in the school who participate in at least ***one field experience.*** Please keep in mind that field trips are a great way to get your students outdoors, but you would want to adjust your trip so that students have the opportunities to collect data in order for it to be considered a field experience.

For example, a field trip can take students on an airboat excursion in the Everglades; ***however***, a field experience can have students collect and compare the water quality data from several different locations, or quantify the different flora and fauna.

Examples of Field Experiences

- Pair the Mangrove Swamp Interactive 360-degree habitat video with a field guide and the provided student field datasheet to conduct a virtual field experience.
- Students attend a field trip to a hardwood hammock to learn about food chains in this habitat. Students analyze and record data on scat samples from animals of the hardwood hammock and try to identify which animal the scat belongs to.
- Students conduct bird counts or other plant/wildlife surveys on or off school grounds and then classify if the species are native or non-native species of the Everglades.

Implementation Idea:

Connect science inquiry to the field experience to use as a science fair project that is environmentally based. When you do a deep dive investigation using science inquiry, these field experiences now become field studies.

Learn more details about field experiences and studies in our Program Resources section found on our website.

Category III: Everglades Community and Culture

THERE ARE 3 INDICATORS FOR THIS CATEGORY:

Category	Possible Points	Indicators		
III. Community & Culture	30	A. Everglades Student Ambassadors (10 points)	B. Community Partnerships (10 points)	C. School Culture (10 points)

A. Everglades Student Ambassadors

The first indicator, Everglades Student Ambassadors, while not mandatory, is a leadership opportunity for your students to be the voice of the Everglades and take action in their schools, homes, and communities.

The purpose of a student ambassador is to educate others about the Everglades and protect the ecosystem through everyday decisions and lifelong commitment.

Ambassadors work both individually and together to produce a positive change in attitude and protection of the environment.

Everglades Student Ambassadors' Guide

The *Everglades Student Ambassadors' Guide* is designed to support educators as they establish Everglades Student Ambassadors at their school. It is complete with an Everglades pledge, research resources, and a step-by-step guide for students to take action in their community.

Student Ambassadors can be a part of a class or a new or existing organization. A school may already have an existing environmental club, garden club, or something similar where it is appropriate to discuss Everglades education and initiatives. A new club or group can also be organized to specifically address Everglades education and initiatives.

Student Ambassadors will exhibit skills such as:

- Brainstorming
- Planning
- Organization
- Dedication
- Good communication
- Collaboration
- Creativity
- Teamwork

Scan the QR code to download or access from our website under the K-5 Champion Schools Program Resources section.

Everglades Student Ambassadors' Pledge

It is ideal to have your Student Ambassadors understand the importance of a pledge, and use it to reflect on throughout the year. Student Ambassadors are agreeing to be an active voice of the Everglades. Signing the pledge is a great way to start off a student ambassador meeting. It is encouraged to provide students with opportunities to share their commitment with teachers, family, and friends.

- Scan the QR code to download the pledge, or print from our website under the Champion Schools "Everglades Student Ambassadors" section.

B. Community Partnerships

The second indicator in this category is Community Partnerships. Partners are businesses or organizations that provide services and/or resources to the school. Through each partnership, schools work with the community at large to teach the importance of Everglades literacy through community and/or service-learning activities. If necessary, virtual connections with community partners are also an option.

The goal of this indicator is that, over time, schools will develop multiple on-going partnerships within the local community. Schools will work together with community partners throughout the year on a regular basis to support your Everglades initiatives.

Tip: Look at the community partnerships that your school already has established and see if there is a way to incorporate an Everglades community and/or service-learning project. It can be beneficial to your school or community.

C. School Culture

The third indicator is School Culture. Administration and strong leadership support is key to being successful in developing an Everglades Champion School culture among your entire school community.

You can start building a culture by forming an Everglades Champion School Team with teachers, administrators, and/or parents that would meet during the school year to discuss your school goals and ways to systematically include Everglades literacy as a core component of your institution.

Everglades literacy as part of the school's culture may be illustrated through:

- School-wide projects
- Community events
- Newsletter articles
- Posts on social media
- Highlights on the school website
- Changes in school policies
- And much more!

Developing an Everglades school culture is about sharing your Everglades Champion Schools efforts with the greater school community.

Category IV: Everglades Extensions: Above and Beyond

The fourth and final category is Everglades Extensions: Above & Beyond. The Everglades Extensions category awards up to ten points to projects that go “above and beyond” the scope of the other categories, or for Everglades initiatives that do not fit neatly in other categories. Everything Everglades has a place in this application!

This category can also be used to document activities where your school went above the maximum requirements in various indicators, an Everglades project that the school is particularly proud of, or "thinking outside the box" initiatives.

Refer to the Evaluation Criteria for examples.

K-5 Everglades Champion™ Schools

LEADERS' GUIDE APPENDIX

Here you will find the attached documents:

- K-5 Everglades Champion Schools Program full Evaluation Criteria
- K-5 Teacher Toolkit Lesson Plans

K-5 Everglades Champion Schools Program

2023 – 2024 Evaluation Criteria

Schools are expected to use the categories & indicators of the evaluation criteria to plan, implement, and report on their Everglades initiatives for each school year.

I. Professional Development
II. Integrating Everglades Literacy into the Curriculum
III. Everglades Community & Culture
IV. Everglades Extensions: Above and Beyond

Questions? Contact the Program Manager, Alicia Torres, at atorres@evergladesfoundation.org

Website: www.evergladesliteracy.org

2023-2024 Evaluation Criteria Overview

The evaluation criteria are based on a point system where the maximum number of points for all four categories is 130 points. The number of points that schools earn on their applications determines their recognition levels:

Bronze (40-70 points), Silver (71-101 points), or Gold (102-130 points).

Highlighted indicators** are mandatory for program recognition. **Proper documentation is required to earn points.

Category	Possible Points	Indicators		
I. Professional Development	40*	A. Everglades Literacy Teacher Trainings (30 points) + (5 bonus points*)	B. Additional Environmental Trainings (10 points)	
II. Integrating Everglades Literacy into the Curriculum	50	A. Everglades Literacy Teacher Toolkit Implementation (30 points)	B. Everglades Interdisciplinary Approach (10 points)	C. Field Experiences (10 Points)
III. Community & Culture	30	A. Everglades Student Ambassadors (10 points)	B. Community Partnerships (10 points)	C. School Culture (10 points)
IV. Everglades Extensions	10	Judges may award up to 10 points for Everglades initiatives that have gone above and beyond the scope of the other categories, or for initiatives that do not fit neatly elsewehre.		
Total	**130**	(+5 if bonus points are awarded)		

I. Professional Development (40 points max.)

Documentation Required for all indicators (A. & B.)

I. A. Everglades Literacy Teacher Trainings (30 points max.) *See Program Requirement

Teachers, staff, and administration use professional development provided by The Everglades Foundation to build a school's Everglades literacy capacity to ensure that all Florida students understand the importance of conserving, protecting, and restoring the Everglades.

Program Requirement: Two teachers must have attended an Everglades Literacy Teacher Training to be eligible to participate in the Everglades Champion Schools Program.

5 points	10 points	15 points	20 points	30 points
At least **15% of your teachers** have attended an Everglades Literacy Teacher Training.	At least **30% of your teachers** have attended an Everglades Literacy Teacher Training.	At least **45% of your teachers from multiple grade levels** have attended an Everglades Literacy Teacher Training.	At least **60% of your teachers from multiple grade levels** have attended an Everglades Literacy Teacher Training.	At least **85% of your teachers from multiple grade levels** have attended an Everglades Literacy Teacher Training.
Bonus Points (Up to 5 points)				
Bonus points will be awarded if a school is a host training site for an Everglades Literacy Teacher Training in the current academic year. Host schools are highly encouraged to invite other schools (private, parochial, charter, public) to attend.				

Examples of documentation may include but are not limited to: spreadsheets of training records (preferred), images of training agendas, sign-in sheets, images that capture teacher participation.

I. B. Additional Environmental Trainings (10 points max.)

Any in-person or virtual trainings, modules, webinars, and/or conferences that focus on the Everglades or environmental topics for teachers, staff, and administration.

The Everglades Foundation has provided modules that are independent, self-paced online professional development opportunities that will increase teachers' content knowledge about various topics of the Everglades. Access all modules from the website: https://www.evergladesliteracy.org/content-modules

1-10 points
Up to 10 teachers attend any additional environmental related professional development opportunities **AND/OR** complete any of The Everglades Foundation's online Everglades Content Knowledge Modules available with a passing score of 60/80 (75%). **Note:** Modules are only valid for the year they are completed and cannot be repeated. To check teacher eligibility, email requests to atorres@evergladesfoundation.org

Examples:

- Attending other speaker series, webinars, and teacher symposiums that are hosted by The Everglades Foundation (Ex. The Annual Everglades Teacher Symposium, Families ForEverglades speaker series, Everglades Restoration Fights Climate Change webinars, and more!)
- Attending environmental-related webinars and/or conference sessions
  - LEEF (League of Environmental Educators in Florida), NAAEE, Native Plant Society, National Parks, Audubon Society & other environmental education organizations in your region
- Attending an Outdoor Learning in the Everglades Professional Development

Examples of documentation may include but are not limited to: images of training certificates, training agendas, confirmation emails of participation, or images that capture teacher participation.

II. Integrating Everglades Literacy into the Curriculum (50 points max.)

Documentation Required for all Indicators (A., B., & C.)

II. A. Everglades Literacy Teacher Toolkit Implementation (30 points max.)

**See Program Requirement*

The K-12 Everglades Literacy Teacher Toolkit offers a set of three (3) lessons that are to be implemented in each grade level. These lessons introduce students to the Fundamental Concepts of Everglades Literacy that students, and all Floridians, should understand.

*Learn more about the concepts on our **website**.*

Access the K-12 Everglades Literacy Teacher Toolkit at https://www.evergladesliteracy.org/teacher-toolkit

Program Requirement: Schools must reach a 5-point minimum to be eligible for the ECS Program.

*5 points	10 points	15 points	20 points	30 points
At least **20%** of the students in your school have participated in the **complete set of the three (3) grade-specific lessons** from the Everglades Literacy Teacher Toolkit.	At least **35%** of the students in your school have participated in the **complete set of the three (3) grade-specific lessons** from the Everglades Literacy Teacher Toolkit.	At least **50%** of the students in your school have participated in the **complete set of the three (3) grade-specific lessons** from the Everglades Literacy Teacher Toolkit.	At least **65%** of the students in your school have participated in the **complete set of the three (3) grade-specific lessons** from the Everglades Literacy Teacher Toolkit.	At least **85%** of the students in your school have participated in the **complete set of the three (3) grade-specific lessons** from the Everglades Literacy Teacher Toolkit.
Note: Teachers who are not Everglades Literacy trained may still implement Everglades Literacy Teacher Toolkit lessons.				

Examples of documentation may include but are not limited to: images of sample student work, images of teaching identified lesson(s), and/or images that capture student engagement.

II. B. Everglades Interdisciplinary Approach (10 points max.)

Schools integrate Everglades-themed interdisciplinary lessons beyond the grade-specific Teacher Toolkit and/or Everglades projects that are implemented across two or more disciplines.

Note: *Any EL Teacher Toolkit lessons that are adapted from* ***another*** *grade level* ***AND*** *are interdisciplinary may be applied here.*

4 Points	6 Points	8 Points	10 Points
At least **20%** of the students have conducted **one (1) Everglades themed interdisciplinary lesson or project.**	At least **40%** of the students have conducted **one (1) Everglades themed interdisciplinary lesson or project.**	At least **60%** of the students have conducted **one (1) Everglades themed interdisciplinary lesson or project.**	At least **80%** of the students have conducted **one (1) Everglades themed interdisciplinary lesson or project.**

Examples of Interdisciplinary Projects:

- As a Teacher Toolkit lesson extension to **Grade 2 – Lesson 2**, *Everglades Seasons*, students design and build their own alligator hole that can be a true-to-size alligator hole with props, a smaller version using paper mache, and/or through a digital platform.
- Students measure components of the alligator hole (i.e. length of an alligator, distance between objects).
  - Disciplines used: Science, Art, Math, Technology
- Other ideas may include Everglades focused STEM lessons, teacher-created project-based learning activities, etc.

Visit our website to see additional instructional resources.

Examples of documentation may include but are not limited to:, images of sample student work, images that capture teacher instruction or student engagement, or screenshots of teacher lesson plan(s).

II. C. Field Experiences (10 points max.)

Students learn about their local natural environments through guided first-hand observations and/or investigation that allows students to collect data. <u>All experiences must have an Everglades connection.</u>

4 Points	6 Points	8 Points	10 Points
At least **20%** of the students have participated in **one (1)** guided **first-hand experience <u>and</u> collected data** in a local natural environment that has an Everglades connection.	At least **40%** of the students have participated in **one (1)** guided **first-hand experience <u>and</u> collected data** in a local natural environment that has an Everglades connection.	At least **60%** of the students have participated in **one (1)** guided **first-hand experience <u>and</u> collected data** in a local natural environment that has an Everglades connection.	At least **80%** of the students have participated in **one (1) guided first-hand experience <u>and</u> collected data** in a local natural environment that has an Everglades connection.
Note: Field experiences are outdoor experiences (in the "field"). Schools are encouraged to visit local nature centers, natural areas, State & County parks, etc. that have an Everglades connection. Field experiences may also occur on or near campus.			

<u>Examples of Field Experiences:</u>

- Conduct and compare data from **<u>water quality testing</u>** at different locations.
- Pair an **<u>Interactive 360-degree habitat video</u>** with a field guide and the provided **<u>student field datasheet</u>** to conduct a virtual field experience. *Additional virtual field studies are available on our website.*
- Students conduct bird counts or other plant/wildlife surveys on or off school grounds and then classify if the species are native or non-native species of the Everglades.

<u>Examples of documentation may include but are not limited to:</u> images of sample student work, images that capture student engagement, a field program agenda, or a field trip letter of site confirmation.

III. Everglades Community & Culture (30 points max.)

Documentation Required for all Indicators (A., B., & C.)

III. A. Everglades Student Ambassadors (10 points max.)

Students model and practice successful collaboration, partnership, and leadership skills to advance Everglades-related initiatives. Students serve to educate others about the Everglades and protect the ecosystem through action.

Download Everglades Student Ambassadors' Guide and Everglades Pledge here or from our website.

4 Points	6 Points	8 Points	10 Points
Student ambassadors are established, and **Everglades activities are integrated** into a new or existing student club(s). Ambassadors sign the **Everglades Pledge** from the EF Student Ambassadors' Guide. School acknowledges these student ambassadors. **Example:** Student ambassadors build an Everglades watershed model in their school club to learn about how water flows through the watershed.	Student ambassadors **create and implement an action plan to teach other students** from different classes/grade levels about the Everglades **(students teaching students).** **Example:** 5th graders teaching 2nd graders about an endangered species found in the Everglades through an extended research project/poster presentation.	Student ambassadors **create and implement an action plan to lead a school-wide project** that promotes Everglades literacy **(students leading school).** **Example:** Student ambassadors organize a school-wide campaign via morning announcements to raise awareness of the ecosystem services that the Everglades provides to people such as filtering pollutants out of the water.	Student ambassadors **create and implement an action plan to with adult decision-makers to implement a community event** that promotes Everglades literacy **(students leading the greater community).** **Example:** Student ambassadors plan and coordinate with PTO, a River of Grass community festival to celebrate the birthday of Marjory Stoneman Douglas (April 7th). April 7th is officially designated as Everglades Day.

III. B. Community Partnerships (10 points max.)

School works with the community at large to teach the importance of Everglades literacy through community and/or service-learning activities/projects that directly benefit the wider community. Partners are businesses or organizations that provide services and/or resources to the school.

4 Points	6 Points	8 Points	10 Points
Community involvement consists of **1-2 guest speakers** that provide Everglades related education to the students and/or within the school community (e.g., parents/families).	Schools work with **one community partner** to conduct Everglades community and/or service-learning activities at least **once or twice a year.**	Schools work with **two community partners** to conduct Everglades community and/or service-learning activities **throughout the year (more than twice).**	Schools work with **two-three community partners** to conduct Everglades community and/or service-learning activities **throughout the year on a regular on-going basis (monthly, weekly, etc.).**
If necessary, virtual connections with community partners to conduct Everglades related education, and Everglades community and/or service-learning activities are permitted (i.e., virtual guest speakers).			

Definitions and examples of "Environmental Community-Service" and "Environmental Service-Learning":

- **Environmental community-service:** Environmentally focused projects and activities that engage students in addressing the needs of their community, but do not necessarily include a learning component.
  - ***Example: Students collecting trash from a local Everglades habitat.***

- **Environmental service-learning:** Environmentally focused projects that involve students in identifying, researching, and implementing solutions to real needs in their community as part of their Everglades learning and/or curriculum goals.
  - ***Example: Students will research local threatened or endangered bird species and work with a local environmental group to build and monitor nest boxes to support their population.***

III. C. School Culture (10 points max.)

Everglades literacy is systematically included as components of school planning, administrative support, and overall school culture. *It can be illustrated through various means of communication (I.e. School-wide projects, community events, newsletters, social media posts, bulletin boards, the school website) that strengthens and involves your school community about your partnership with The Everglades Foundation to become an Everglades Champion School. An Everglades Champion School (ECS) team is established to lead these efforts.*

4 Points	6 Points	8 Points	10 Points
Administration and school faculty are involved in the school's Everglades literacy & Champion Schools initiatives. The Everglades Champion School (ECS) team includes **at least two (2) Everglades trained teachers** that **meet periodically (3-4 times)** throughout the year to develop and implement Everglades literacy initiatives. **Examples:** Faculty meeting updates related to ECS, promoting trainings, interdepartmental communication, planning meeting with admin, grade level highlights, share-fairs	**The entire school body is involved** in the school's Everglades literacy & Champion Schools initiatives. The Everglades Champion School (ECS) team includes **at least four (4) Everglades trained teachers across multiple grade levels** that meet **on a regular basis (monthly, weekly, etc.)** throughout the year to develop and implement Everglades literacy initiatives. **Examples:** Everglades word of the day on morning announcements, Everglades gallery walk of student work in common area, Everglades door decorating contest	**Families and visitors as well as the school body are involved** in the school's Everglades literacy & Champion Schools initiatives. The Everglades Champion School (ECS) team includes **at least four (4) Everglades trained teachers across multiple grade levels and one (1) administrator that meet on a regular basis (monthly, weekly, etc.)** throughout the year to develop and implement Everglades literacy initiatives. **Examples:** Parent newsletters include ECS updates, school kiosk displays Champion School status or level goal, banners are publicly displayed, school website, digital signature banners included, parents invited to Everglades gallery walk of student work	The school's efforts to be an Everglades Champion School are shared with **other schools and the wider community.** The ECS team includes representation of the **whole-school community**. A diverse mix of trained teachers, students, administrators, staff, parents, and/or community reps will meet on a **regular basis (monthly, weekly, etc.)** throughout the year to develop and implement Everglades literacy initiatives. **Examples:** Annual Celebration of Everglades Day, Everglades Literacy Week, ECS recruits/mentors new schools, Everglades centered public events involving community partners.

Examples of documentation may include but are not limited to, meeting sign-in sheets, agendas, emails, photos, website links, or campus signage.

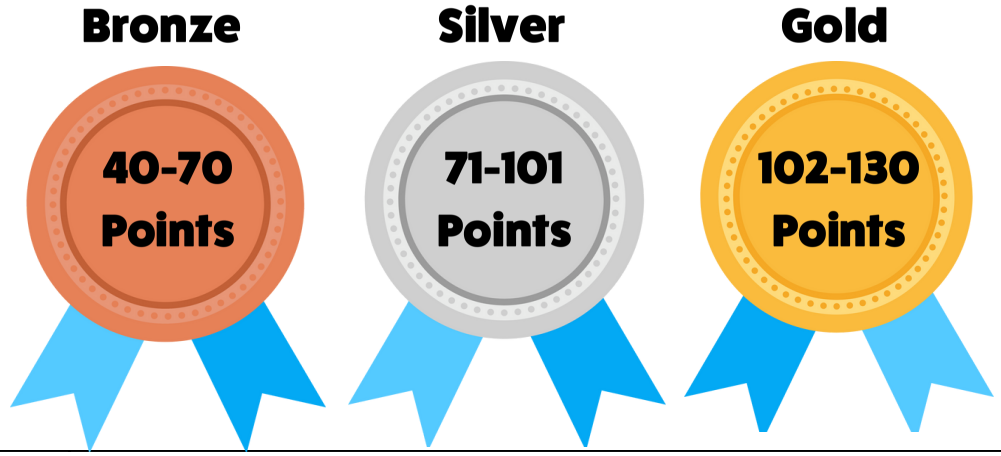
IV. Everglades Extensions: Above and Beyond (10 points max.)

Up to <u>ten (10) points</u> are awarded for Everglades-related initiatives that go "above and beyond" the scope of the other categories, or for Everglades initiatives that do not fit in neatly elsewhere. This is your chance to be creative!

Examples:

- Additional Interdisciplinary Projects or Field Experiences that have not been included in Indicators II. B. or C.
- Additional teachers that successfully complete online modules that have not been already included in Indicator I.B.
- Recruiting and/or mentoring other schools to become Everglades Champion Schools.
- PTO/PTA members attend Everglades Literacy Teacher Trainings.
- Fundraising initiatives to support Everglades-focused field trips and/or projects.
- Everglades-focused Science Fair Projects.
- Student presentations at public events. E.g., Everglades Day; Broward County for Water Matters Day; District Science Fair; or other county-wide water/environmental initiatives.
- Starting an Everglades book club or book share (for students, teachers and/or parents).
- Integrating your Everglades initiatives as part of county, state, or national Green Schools program.
- **AND MORE! THE SKY'S THE LIMIT!**

LEVELS OF RECOGNITION



Everglades Lesson Breakdown

Grade Theme	Lesson Number	Title of Lesson Summary of Lesson	Standards	Fundamentals Concepts
Kindergarten The Everglades is a special place that is home to plants and animals.	1	**What is the Everglades?** Students will be introduced to the Everglades, learning about this special place for plants and animals that is unlike anywhere else on Earth. They will watch a presentation on some of the animals that live in the Everglades and start working on their Everglades coloring book.	SC. K. L.14.3, LAFS.K.RL.1.3, LAFS.K.RL.2.6, LAFS.K.W.3.8, LAFS.K.SL.1.2, LAFS.K.SL.2.6	1, 5
	2	**Everglades Animals** Students will review the similarities and differences between some of the animals that live in the Everglades. They will continue to work on their Everglades coloring book.	SC.K.L.14.3, SC.K.N.1.5, LAFS.K.W.1.2, LAFS.K.SL.1.2	1, 5
	3	**Who Lives in the Everglades?** Students will engage in an interactive presentation to review some of the animals that live in the Everglades. Then, they will sort cards depicting animals that do and do not live in the Everglades.	SC.K.N.1.4, LAFS.K.W.3.8, LAFS.K.SL.1.2, LAFS.K.SL.1, LAFS.K.SL.2.5	1, 5
First Grade Habitats display the vital relationship between plants, animals, and water in the Everglades.	1	**Everglades Animal Exploration** Students will learn that animals communicate through their senses. The students will use their knowledge and imagination to vocally and/or physically imitate wildlife of the Everglades.	SC.1.L.14.1, SC.1.N.1.2, LAFS.1.SL.1.1, LAFS.1.SL.2.6	1, 5
	2	**The Everglades-Florida's Treasure** Students will be introduced to the plants and wildlife that live in different habitats of the Everglades. Students will identify which habitat(s) organisms live in by sorting cards depicting plants and animals.	SC.1.L.17.1, LAFS.1.SL.1.2	1, 5
	3	**Water For Us All** Students will discuss and identify the different ways humans and animals use water. They will complete a matching handout and make the connection that the Everglades is the primary source of freshwater for people, plants, and animals in South Florida.	SC.1.L.17.1, SC.1.E.6.2, LAFS.1.SL.1.2, LAFS.1.SL.2.5	1, 2

Everglades Lesson Breakdown

Grade Theme	Lesson Number	Title of Lesson Summary of Lesson	Standards	Fundamentals Concepts
Second Grade The behaviors of American alligators and other important species play a huge role in the wet and dry seasons of the Everglades ecosystem.	1	**Don't Feed the Gators!** Students will read a book on the importance of American alligators and act out a short play which demonstrates the dangers of feeding wild animals.	SC.2.L.17.2, SC.2.L.17.1, LAFS.2.SL.2.6	1, 2, 5, 7
	2	**Everglades Seasons** Students will act out an ecodrama in an alligator hole during the dry season. Each student will play the role of an animal that depends on the alligator hole. Students will identify the American alligator as a keystone species that enables other species to survive.	SC.2.L.17.1, SC.2.L.17.2, LAFS.2.SL.1.2	1, 2, 5, 7
	3	**Wet Season - Dry Season: Fish Relay** Students will be learning about water levels and how they affect the amount of food available for wading birds, such as the Wood Stork. Students will run a relay race imitating parent Wood Storks feeding their babies; one team during the wet season, the second team during the dry season.	SC.2.L.17.2, SC.2.N.1.3, LAFS.2.W.3.8	1, 2, 5, 7
Third Grade Highlighting the flora, fauna, and habitats of the Everglades.	1	**Classifying Everglades Animals and their Habitats** Students will learn that animals can be classified into six major animal groups and become familiar with Everglades animals in these groups. Students will also learn about the five different habitats of the Everglades where these animals live.	SC.3.L.15.1, SC.3.N.1.1, LAFS.3.W.1.2, LAFS.3.SL.1.1, LAFS.3.SL.1.3	1, 5
	2	**Classifying Everglades Plants and their Habitats** Students will identify plants of the Everglades using a dichotomous key and become familiar with the five different habitats of the Everglades where these plants live	SC.3.L.15.2, LAFS.3.RI.1.3	1, 5
	3	**Hurry for a Habitat!** Students will use a relay race activity to reinforce knowledge learned in Lesson 1 and Lesson 2.	SC.3.N.1.1, SC.3.L .15.1	1, 5

Everglades Lesson Breakdown

Grade Theme	Lesson Number	Title of Lesson Summary of Lesson	Standards	Fundamentals Concepts
Fourth Grade Understanding how threatened and endangered species and negative human impacts affect the producers, consumers, and food chains in the Everglades.	1	**Everglades Food Chains** Students will learn about specific Everglades producers, consumers, and food chains through role play.	SC.4.L.17.3, SC.4.L.17.4, MAFS.K12.MP.2.1	1, 5
	2	**Wanted - Alive!** Students will read a book about the changes to the Everglades. They will research a threatened or endangered animal species and create a poster of their findings.	SC.4.L.17.4, LAFS.4.W.3.7	6, 7
	3	**I'm in Big Trouble!** Students will play a game that demonstrates how animal populations can be negatively impacted by humans.	SC.4.L.17.4, LAFS.4.W.1.1	5, 6, 7
Fifth Grade An introduction of exotic and invasive species in the Everglades and the effects of habitat loss.	1	**Incredible Shrinking Habitat** Students will become Florida panthers, white-tailed deer, and motor vehicles in an active, tag-like game to simulate the disappearance of Everglades habitats and its effect on native wildlife.	SC.5.L.15.1, SC.5.N.2.1, LAFS.5.RI.1.3, LAFS.5.SL.1.1	1, 5, 6, 7
	2	**Invasive Species** Students will examine the effects of exotic and invasive species in an ecosystem using riddles and research. Students will be able to explain how exotic and invasive species can harm native species or habitats in the Everglades.	SC.5.L.15.1, LAFS.5.RI.1.3, LAFS.5.SL.1.1	1, 5, 6, 7
	3	**Fishy Business** Students will examine the effect of invasive species on an ecosystem by role-playing both a healthy food chain, and a food chain that has been impacted by Mayan cichlids. In the process of role-playing, students will compare and contrast the adaptations of a native species and an invasive species.	SC.5.L.17.1, SC.5.N.1.1, LAFS.5.L.3.6, LAFS.5.W.3.8	1, 5, 6, 7

What is the Everglades?

Grade Level: Kindergarten

Objective:

Students will be able to:

- Explain that the Everglades is a special place in Florida for many different plants and animals.
- Observe and identify Everglades animals that live in water and on land.
- Identify the main topic and retell key details from the Everglades PowerPoint presentation and I Am a Little Alligator book.
- Identify characters, settings, and major events in I Am a Little Alligator.

Standards:

- SC.K.L.14.3 - Observe plants and animals, describe how they are alike and how they are different in the way they look and in the things they do.
- LAFS.K.RL.1.3 - With prompting and support, identify characters, settings, and major events in a story.
- LAFS.K.RL.2.6 – With prompting and support, identify the author and illustrator of a story and define the role of each in telling the story.
- LAFS.K.W.3.8 - With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

At A Glance:

Students will be introduced to the Everglades, learning about this special place for plants and animals that is unlike anywhere else on Earth. They will watch a presentation on some of the animals that live in the Everglades and start working on their Everglades Coloring Book.

Background:

The **Everglades** is many different things to many people: an escape from their urban habitat; a place to photograph, canoe, or fish; a place for bird watching; a place of beauty, of peace; a place to see "unusual" animals. Encouraging students to discover what they value in our national parks, such as Everglades National Park, is a first step toward a commitment to preserving this part of our southern Florida environment.

Preparation:

1. Make copies of the coloring pages for the students.
2. Review the What is the Everglades? PowerPoint ahead of time and have it loaded before the lesson begins.
3. Load the Way Down Deep in the Everglades book in PowerPoint format on your computer.

Procedure:

1. Explain to the students that over the next few days, they are going to be learning about a very special place called the Everglades. Let them know that the Everglades is unlike anywhere on Earth and that Florida is the home of the Everglades! We are very lucky to have it.
2. Ask if the students have ever heard of the Everglades and what they know about it.
3. Explain that one reason the Everglades is a special place is because of the many plants and animals that live there.
4. Draw a two column chart and ask students to list characteristics of animals that live in the water and animals that live on land. For example, webbed feet, gills, wings, and fur. If necessary, explain to students that there are mammals that live in the water and breath with lungs, like a Manatee. There are also animals that nest and spend most of their time on land but hunt on the water like an Anhinga.
5. Show What is the Everglades? PowerPoint. The slides have one slide with just a picture of the animal followed by a slide with the name of the animal so that the students can participate by trying to guess the name of each animal. Ask the students what they observe about each animal. Prompt student's observation by asking them to find one special feature that is unique about each animal.

- LAFS.K.SL.1.2 - Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.
- LAFS.K.SL.2.6 - Speak audibly and express thoughts, feelings, and ideas clearly.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 5

Duration: 60 minutes

Materials:

- Coloring Sheets (1 different sheet per student)
- What is the Everglades? PowerPoint
- Way Down Deep in the Everglades PowerPoint
- Crayons

Vocabulary

- **American alligator** - A large reptile with short legs, a long body and tail, and a long, wide snout. They are protected by thick skin with many hard bumps.
- **Everglades** - A natural region in southern Florida containing many different types of habitats, plants and animals.

6. Note: There is information on the PowerPoint about the animals. The notes are to be used to discuss the animal characteristics and behaviors. Conversation should be geared towards the students being able to identify which animals live in water and which live on land. Ask students to discuss whether the animal lives in water or on land. Prompt students to identify another animal that also lives in water or on land from the PowerPoint.
7. Revisit the two column chart and ask students if their original thoughts were correct. Have them add more characteristics based on what they learned in the PowerPoint.
8. Explain that over the next few days they will be learning about some of the special plants and animals that live in the Everglades.
9. Explain that one special animal that lives in the Everglades is the **American alligator**!
10. Read aloud the Way Down Deep in the Everglades book in PowerPoint format. Before beginning, ask students what 'job' an author has. Point out to the students that the authors of this story were a team of people working together. Also point out the various visuals part of the PowerPoint. Ask, "How do you think the author uses images to help write the story?".
11. Discuss the characters, setting and events in the story with the students. Use these questions to prompt students: Who is the main character of this story? Are there any other characters? Where does the story take place? What are some of the events that happen in the story? You may want to chart the students' responses to these prompting questions on the board.
12. Explain that the American alligator is only one of the animals that live in the Everglades and in the next part of the lesson, each person is going to get a page to color of a different animal that lives in the Everglades.
13. Let the students know that after everyone has colored their animal, they are going to make an Everglades class book or Everglades wall mural.
14. Hand out one page per student and have them color their animal. Collect student coloring pages once they are finished (these will be used in Lesson 2).
15. Explain that tomorrow they are going to present their page to the class and learn a little bit more about the animals that live in the Everglades.

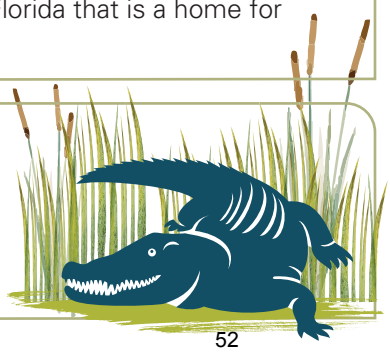
Assessment:

1. Ask the students which Everglades animal from the PowerPoint or the story was their favorite and why. Ask them to explain at least one reason this animal is their favorite.
2. Have the students tell you in their own words what the Everglades is (A special place in Florida that is a home for many plants and animals.)

Resources:

(1982). *The Everglades Coloring Book.* Miami, FL: Florida Flair Books.

FAU/Pine Jog Environmental Education Center.



Everglades Animals

Grade Level: Kindergarten

Objective:

Students will be able to:

- Explain that the Everglades is a special place in Florida for many different plants and animals.
- Describe how some of the Everglades animals are alike and how they are different using a combination of drawing, dictating, and writing.
- Communicate orally and clearly their favorite Everglades animal and one of its characteristics.

Standards:

- SC.K.L.14.3 - Observe plants and animals, describe how they are alike and how they are different in the way they look and in the things they do.
- SC.K.N.1.5 - Recognize that learning can come from careful observation.
- LAFS.K.W.1.2 - Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.
- LAFS.K.SL.1.2 - Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.

At A Glance:

Students will review the similarities and differences between some of the animals that live in the Everglades. They will continue to work on their class Everglades Coloring Book.

Background:

The **Everglades** is a place, a marsh, a region, a watershed, an ecosystem. The Everglades is "a river of grass." The watershed includes diverse habitats and living communities. It shapes and is shaped by the land and patterns of human use. The Everglades includes freshwater marshes and swamps, rivers, sloughs, hardwood hammocks, pinelands, and mangrove swamps.

Preparation:

1. Review the Everglades Animals PowerPoint and teacher notes ahead of time and have it loaded before the lesson begins.

Procedure:

1. Ask the students what they remember from Lesson 1, reviewing some of the animals you discussed that live in the Everglades.
2. Explain to students that they are going to learn a little bit more about some of the animals that you talked about in Lesson 1 and figure out some of the ways animals are the same and some of the ways they are different.
3. Hand out the coloring pages from Lesson 1 to each student. Tell the students to leave their coloring page on their desk as we look at the PowerPoint.
4. Review teacher notes in the PowerPoint. Show Everglades Animals PowerPoint.
5. Go through the slides and talk about the similarities and differences that can be observed. Have the students point out as many similarities and differences for each pair of organisms as possible. The information on the slide matches the text on each student's coloring page.
6. Tell the students that "we are all going to finish the sentence on our coloring pages together." Ask the students, "where do all of our animals live?" The answer is **the Everglades**.
7. Write the words, ***the Everglades***, on the board while the students write it in the sentence on their coloring page. The sentence is the same for all coloring pages, ***I can be found living in*** _____. Each student should write the Everglades in the blank space.
8. Read the finished sentence aloud to the class and then have every one read it aloud together.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 5

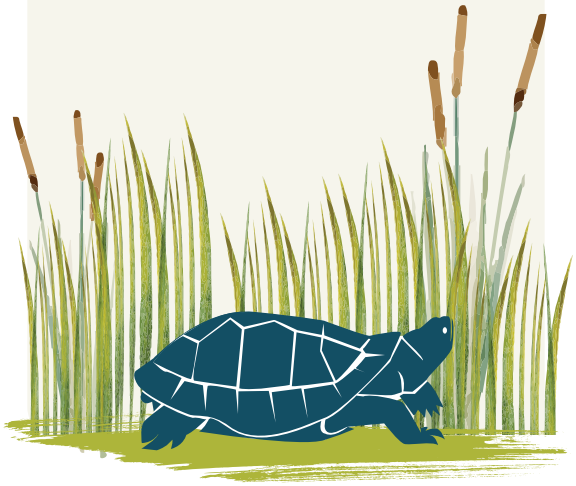
Duration: 60 minutes

Materials:

- Everglades Animals PowerPoint
- Coloring pages from previous Lesson 1
- Comparing Everglades Animals worksheet
- Stapler

Vocabulary:

- **Everglades** - A natural region in southern Florida containing many different types of habitats, plants, and animals.



9. Group students by pairing them using the coloring pages they completed in Lesson 1 which were identified in the PowerPoint, i.e. Alligator and Crocodile. Instruct the students to look closely at both pictures and then discuss what is the same and what is different about the two animals.
10. Hand out the Comparing Everglades Animals worksheet. Have students draw what is the same and what is different on the worksheet.
11. Collect the coloring pages and post them around the classroom. Use a gallery walk and have students write down one new thing they learned from other student's work.
12. Make an Everglades class book by stapling all the coloring pages together.
13. Read the book aloud, congratulating the students on making such a fine book!
14. Review each student's comparison sheets to assess student ability to make comparisons between paired organisms.
15. Ask students to draw and name their favorite Everglades animal and list one of its characteristics. Have students present their animal and its characteristic to the class.

Assessment:

1. Use the Comparing Everglades Animals worksheet to identify two to three similarities and differences. Assess each student's ability to identify that one similarity for each pair is that they live in the Everglades and that one difference is identified. For example, an alligator's snout is rounded or U-shaped and a crocodile's snout is more pointed or V-shaped.

Resources:

(1982). The Everglades Coloring Book. Miami, FL: Florida Flair Books.

FAU/Pine Jog Environmental Education Center.

Who Lives in the Everglades?

Grade Level: Kindergarten

Objective:

Students will be able to:

- Draw an Everglades animal and label at least three of its major features.
- Answer questions about specific Everglades animals based upon information presented in PowerPoint presentation and from prior lessons.
- Sort a group of animals into who lives in the Everglades and who does not live in the Everglades.

Standards:

- SC.K.N.1.4 - Observe and create a visual representation of an object which includes its major features.
- LAFS.K.W.3.8 - With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.
- LAFS.K.SL.1.2 - Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.
- LAFS.K.SL.1 - Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.

At A Glance:

Students will engage in an interactive presentation to review some of the animals that live in the Everglades. Then, they will sort cards depicting animals that do and do not live in the Florida Everglades.

Background:

Animals live only where they can get the items needed for survival: food, water, shelter, and space. Certain animals can only live in certain areas to get these items. For example, the African elephant or polar bear would not be able to survive in Florida because they would not be able to find the food, water, shelter, and space in Florida that they need for survival. Also, the climate would not be comfortable for a polar bear – it would be much too hot for it to survive.

The animals that do not live in Florida on the Animal Sorting Cards are: the African elephant, polar bear, Emperor Penguin, orca whale, koala, giant panda, clownfish, ring-tailed lemur, plains zebra, and the Eastern grey kangaroo.

The animals that do live in Florida on the Animal Sorting Cards are: the Anhinga, American alligator, Florida panther, snapping turtle, raccoon, black bear, Roseate Spoonbill, Wood Stork, Purple Gallinule, and grey fox.

Preparation:

1. Review the Who Lives in the Everglades? PowerPoint ahead of time and have it loaded before the lesson begins.
2. Prepare multiple sets of the Animal Sorting Cards in order for students to work in small groups.

Procedure:

1. Explain to the students that they are going on an imaginary journey with two friends as they take a walk through the **Everglades**.
2. At each slide that poses a question, allow students to answer the question and give supporting details for their answer before advancing to the next slide which reveals the correct answer. If students do not give the correct response to the question posed, go back to the previous slide and review the characteristics with the students.
3. You might also want to have your students identify the rhyming words on each PowerPoint slide.
4. When you have finished the PowerPoint 'journey', have the students draw their favorite animal and label at least three of its major features from the last few days of learning about the Everglades.
5. Help each student construct one sentence to add to their illustration to answer the question, "What is special about your Everglades animal?" and include at least one fact that they learned about their favorite animal in the Everglades.

a. Follow agreed-upon rules for discussion (e.g., listening to others and taking turns speaking about topics and texts under discussion).
b. Continue a conversation through multiple exchanges.

- LAFS.K.SL.2.5 - Add drawings or other visual displays to descriptions as desired to provide additional detail.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 5

Duration: 60 minutes

Materials:

- Who Lives in the Everglades? PowerPoint
- Paper
- Crayons
- Animal Sorting Cards (1 set per group)
- Hula hoops (2 different colors)

Vocabulary:

- **Everglades** - A natural region in southern Florida containing many different types of habitats, plants, and animals.

6. Have the students present their drawings, labels and sentences to the rest of the class.
7. Tell the students that in the next activity, they are going to work in collaborative groups to show how much they have learned about which animals live in the Everglades and which animals do not live in the Everglades.
8. Review with your students the rules for working within a group. If you have not previously developed norms for group work with your class, then students may develop these rules together and adopt them as a class, e.g., taking turns speaking and listening, respect each other's thoughts, stay focused on the assigned task, etc.
9. Place students in groups of 3 or 4. Tell them that as a group, they are going to receive a set of 20 cards. There are 10 animals that live in the Everglades, and 10 that do not live in the Everglades. Their job is to decide which ones do live there and put them into a pile, and then decide which ones do not live in the Everglades, and put them into a pile.
10. Remind students of the agreed upon rules for discussion in a group, e.g., taking turns speaking and listening to each other. Hand out the cards to each group.
11. Help the students as needed deciding which animals belong in the Everglades, and which do not. Check each group's sorting piles to see if animals have been placed correctly. As you circulate to each group, ask them to justify their sorting.
12. After all groups have completed their sorting, with the whole class, hold up each animal card and rotate asking each group if the animal you are holding lives in the Everglades or not. Give each group an opportunity to respond to at least one animal card. Check to see if all groups agree with the answer given by one group.
13. Collect the cards and tell students they will now play a relay game to see who can put the animals in the correct category, animals that "live in the Everglades" and animals "that do not in the Everglades".
14. Place two hula hoops in front of the class and identify one hula hoop where the students will put animals that live in the Everglades and another hula hoop where the students will place the animals that do not live in the Everglades. Hand each student an animal card face down. Have all students line up single file. Explain to the class that when you say go, one at a time each student will look at the animal and put the card face up in the hula hoop where the animal belongs, animals that "live in the Everglades" and animals "that do not in the Everglades".
15. Congratulate the students on learning so much about the different animals that live in the Everglades!

Assessment:

1. Students draw their favorite Everglades animal and with the support of the teacher label three of its major features and write one sentence with a fact about their animal to answer the question, "What is special about your Everglades animal?"
2. Students sort the animals that live in the Everglades and animals that do not live in the Everglades into the correct group.

Resources:

FAU/Pine Jog Environmental Education Center.

Everglades Animal Exploration

Grade Level: 1st

Objective:

Students will be able to:

- Explain at least two reasons why animals communicate.
- Demonstrate sounds and movements of at least two Everglades animals.
- Write a complete sentence describing how an Everglades animal communicates.
- Make observations of Everglades animals using their five senses.

Standards:

- SC.1.L.14.1 - Make observations of living things and their environment using the five senses.
- SC.1.N.1.2 - Using the five senses as tools, make careful observations, describe objects in terms of number, shape, texture, size, weight, color, and motion, and compare their observations with others.
- LAFS.1.SL.1.1 - Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.
- LAFS.1.SL.2.6 - Produce complete sentences when appropriate to task and situation.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 5

At A Glance:

Students will learn that animals communicate through their senses. The students will use their knowledge and imagination to vocally and/or physically imitate wildlife of the Everglades.

Background:

Humans and wild animals use a variety of **senses** to **communicate**, including **sight**, **smell**, **sound**, **taste**, and **touch**. Wild animals use these communication strategies to **defend** themselves and to escape from predators, to protect their space, to find a mate, and to raise their young.

Animals in the Everglades use these same strategies to help them live in their habitats. Some Everglades habitats are wet (such as sawgrass marshes, cypress swamps, or mangrove swamps) so the animals that live there have to be able to either swim or move across wet vegetation. Some habitats are mostly dry (such as hardwood hammocks and pine flatwoods), so animals that live there are adapted to be able to move quickly through trees and underbrush. Animals use sounds to help them survive as well. They use sound to communicate with each other – to warn about danger or to scare off a predator. They also use sounds to help them attract a mate, or call to their young.

Preparation:

1. Cut out Animal Exploration Cards (2 sets).
2. Queue up the PowerPoint. Check animal movement links to make sure they are accessible. Read the notes on the PowerPoint for background information.

Procedure:

1. Ask your students what the five primary senses are (explain if necessary).
2. Have students talk about how our senses help us in our everyday lives.
3. Discuss that animals have senses too, and make sounds and movements just like we do to communicate. Have students demonstrate certain animal movements that they all know, like a mouse. How do you communicate with your friends through sounds and movements?
4. Ask the students what they know about the Everglades. Discuss for a few minutes to determine prior knowledge. Tell them the Everglades is a special place in Florida. Tell them many animals live there, and that today we are going to learn about some of them!

Duration: 60 minutes

Materials:

- Animal Cards (2 sets)
- Everglades Animal Exploration PowerPoint

Vocabulary:

- **Communicate** - To exchange ideas or information.
- **Defend** - To protect or guard.
- **Senses** - Any of five ways to experience your environment. The senses are touch, smell, taste, sight, and hearing.
- **Sight** - The ability to see, using your eyes.
- **Sound** - Anything that people or animals hear with their ears.
- **Smell** - To sense something by means of the nose.
- **Taste** - To tell the flavor of some thing by putting it into your mouth.
- **Touch** - To put one's hand or fingers on something in order to feel it.

5. Show students the Everglades Animal Exploration PowerPoint. Using the image on the slide, for each animal, ask the students to use their sense of sight to make observations. From these observations do they think the animal lives on land, in water, or both?
6. Now click to the next slide. Each slide contains hyperlinks to short video clips that illustrate animal movements and/or vocalization. Ask students to use sight and hearing to make observations about how these animals move and sound. Does where the animal live (either on land or in water or both) affect how it moves and sounds? How does that help the animal survive in the Everglades?

   ***Cue students to use their senses and pay close attention to how the animal moves, sounds, and behaves.**
7. Explain that today they are going to act out the sounds and movements some Everglades animals make. Students may use their whole bodies or just arms, hands, and mouths.
8. **Round one** - Have all the students stand in a circle. Draw one of the animal cards and have students practice acting out how the animal moves and sounds. Do this for each of the ten animals.
9. **Round two** - Pass out one animal card to each students, and tell them to keep the animal they have a secret. Explain to them that there is another student who received the same animal card they did. They will be trying to find each other through their actions and sounds, without showing anyone their card.
10. Explain that some of the animals may not make sounds that we can easily hear, therefore, students will have to carefully use all of their senses to find their match.
11. On your signal, one at a time, they will begin acting like the animal on their card, while the others use their senses to make observations to determine if their animal sound/movement is the same.
12. When they find their partner, they will stand or sit together and wait until all of the other students have found their match.
13. Ask each student pair to discuss which senses they used to find each other, and talk about how each animal communicates. For example, the American Alligator bellows. Go around to each pair and ask them to share their findings.
14. If some students weren't able to figure out how to move or sound like the animal on their card, have their classmates give them suggestions.
15. Shuffle the cards and do the activity again.
16. Review with students how the animals they portrayed communicate using sounds and movements.
17. Discuss that the animals in the Everglades all move and sound differently to survive and we can make observations about them using senses.

Assessment:

1. Describe how one of the animals thatlive in the Everglades moves and/or sounds. How does that help them survive? What senses did you use to find out how the Everglades animal communicates? Describe how the animal communicates? Did the animal use any senses to communicate? If so, which ones?

Resources:

FAU/Pine Jog Environmental Education Center.

Everglades National Park (2006). Nature Hunt. In Everglades ABC's- Activity Guide for Grades K-3 Teachers (Section 3: Kindergarten Activities). Retrieved from http://www.nps.gov/ever/forteachers/k-3guide.htm

The Everglades – Florida's Treasure

Grade Level: 1st

Objective:

Students will be able to:

- Recognize that Everglades animals live in a specific habitat in order to meet their basic needs.
- Describe what a habitat is and name at least two animals that can be found in one or more habitats in the Everglades.

Standards:

- SC.1.L.17.1 - Through observation, recognize that all plants and animals, including humans, need the basic necessities of air, water, food, and space.
- LAFS.1.SL.1.2 - Ask and answer questions about key details in a text read aloud or information presented orally or through other media.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 5

Duration: 60 minutes

Materials:

- What is the Everglades? PowerPoint
- Florida's Treasure Cards (habitats/animals/plants)
- Exit Slip

At A Glance:

Students will be introduced to the plants and wildlife that live in different habitats of the Everglades. Students will identify which habitat(s) organisms live in by sorting cards depicting plants and animals.

Background:

All living things need food, water, shelter and space to survive. This lesson focuses on some of the plants and animals that call the Everglades home. Several Everglades **habitats** are introduced.

Within the Everglades is a collection of numerous habitat types. A habitat is a home for plants and/or animals and provides food, water, shelter and space. A habitat can exist in any size and can be as small as a log that is decaying on the forest floor or as large as a vast prairie. Habitats contain both living and nonliving things.

Five of the major habitat types found in the Everglades are: **sawgrass marshes, cypress swamps, mangrove swamps, hardwood hammocks,** and **pinelands**. Sawgrass marshes, cypress swamps, and mangrove swamps are primarily wet habitats, with plants and animals that are adapted to living in or around water. Hardwood hammocks and pinelands are primarily dry habitats with plants and animals that are best suited to living on dry ground.

Some wildlife species live in only one type of habitat, while others move from one habitat to another depending on the availability of food, water, shelter, and space.

Preparation:

1. Review the What is the Everglades? PowerPoint ahead of time and have it loaded before the lesson begins.

Procedure:

1. Ask students if they have ever been on a treasure hunt. Then ask if they have ever heard of the Everglades. Tell them that many people think of the Everglades as a 'treasure'. Discuss what they think they know about the Everglades and why it might be considered a treasure. People usually refer to a treasure as something very valuable to them and/or others. Tell students that there are many special habitats that make up the Everglades. Review with students what a habitat is.
2. Tell students you are going to share with them a PowerPoint that might help explain why the Everglades is a treasure.
3. Ask students if they know the basic things that all plants and animals need to survive (air, water, food, and space).

Vocabulary:

- **Cypress swamp** - The most common and widespread of the Everglades freshwater swamps, dominated by cypress trees.
- **Habitat** - a home for plants and/or animals and provides food, water, shelter, and space.
- **Hardwood hammock** - A dense group of broad leafed trees that grow on only a few inches in elevation.
- **Mangrove swamp** - a swamp in the Everglades that is dominated by mangrove trees. Mangrove trees are salt-tolerant trees that thrive amidst the harsh growing conditions.
- **Pinelands** - A forested area where pine trees and saw palmetto dominate.
- **Sawgrass marsh** - A wetland where sawgrass, a plant that has spiny, serrated leaves, is the most dominant plant found.

4. Show What is the Everglades? PowerPoint. The slides have one slide with just a picture of the animal/plant followed by a slide with the name of the animal/plant so that the students can participate by trying to guess the name of the animal/plant. You might want to ask them what they observe about each animal/plant before describing it for them. Ask students if they think the animal lives in a wet or dry habitat. Guide them to infer from the picture - could the animal swim? Does it have long legs that it could use to could stand in or walk through water? What kind of food do they think the animal would eat? What kind of habitat would they find that food (wet or dry?).
5. Note: There is information on the PowerPoint about the animals/plants. Use your discretion to determine how much information on each one to include during the lesson.
6. Ask students what they thought of the PowerPoint. Did any of them see an animal that they knew? Did any of them see an animal that they have never seen before? Discuss appropriately.
7. Recall with the students that a habitat is a place where animals live. Habitats provide food, water, shelter and space.
8. Discuss with the students that Earth has many different habitats. Habitats are areas in which different kinds of plants and animals live and get their needs met. Every habitat has its own unique ecosystem. In a balanced ecosystem, plants and animals live side by side and help each other survive. In the Everglades, there are unique habitats with plants and animals living together. Some of the habitats are wet, and some of them are dry.
9. Ask students to recall the five Everglades habitats and review key details about each habitat.
10. Post the habitat photos at the front of the room.
11. Hand out Florida's Treasure Cards (one set per pair of students). Tell students they are going to sort them into whether they live in wet or in dry habitats.
12. After students have completed sorting, assign each student pair one plant or animal to present. Have each pair come to the front of the room and present their plant or animal to the class and then place it in front of the habitat.
13. Have the students explain how the habitat they chose meets the animal's basic needs for survival.
14. Ask the students to revisit the idea of why many people say the Everglades is a treasure.
15. Hand out the Exit Slip to each student, have students write the definition of a habitat in their own words and then draw or describe two Florida Everglades animals in their habitats in the boxes, see assessment.

Assessment:

1. Student Presentations. While placing the plant or animal into the habitat, have the student use the word "because." "I think the _____ belongs in the _____ because it meets the animal's basic needs by_____"
2. Using Exit Slip, identify two Florida Everglades animals and the habitat(s) that they live in. Draw the animals in their habitat. Explain how the habitat meets the animals' basic needs.

Resources:

FAU/Pine Jog Environmental Education Center.

Water For Us All

Grade Level: 1st

Objective:

Students will be able to:

- Explain that water is important for daily use for all animals.
- Explain that the Everglades is an important place where we get water.
- Name one way we use water and one way that wildlife uses water.
- Name one way we can conserve water.

Standards:

- SC.1.L.17.1 - Through observation, recognize that all plants and animals, including humans, need the basic necessities of air, water, food, and space.
- SC.1.E.6.2 - Describe the need for water and how to be safe around water.
- LAFS.1.SL.1.2 - Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- LAFS.1.SL.2.5 - Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 2

Duration: 60 minutes

AtAGlance:

Students will discuss and identify the different ways humans and animals use water. They will complete a matching handout and make the connection that the Everglades is the primary source of freshwater for people, plants, and animals in southern Florida.

Background:

The water that we use today is the same water that has always been on Earth. The water is recycled over and over in different forms. The rain that showers on us, once showered the dinosaurs, George Washington, and Albert Einstein, etc.

Water is one of the basic needs of life. Without it, all living things would perish. Plants and animals have a need for water throughout their entire lives.

Apart from drinking it to survive, people have many other uses for water. These include, but are not limited to: cooking, washing bodies, washing clothes and dishes, keeping houses and communities clean, recreation - such as swimming pools, keeping plants alive in gardens and parks, and is essential for the healthy growth of farm crops and farm stock. Water is used in the manufacture of many products and for many other things!

Water is very important to the health of the Everglades, and the health of the Everglades is very important to us! More than 7 million residents of Southern Florida (1 out of 3 Floridians) rely on the Everglades for their water supply. When it rains in the Everglades, the **wetlands** act as an enormous sponge. Water seeps through a porous aquifer, which acts like an underground river. Florida cities tap into the aquifer with a series of pipes for their water supply.

Water conservation is something that everyone can help with. Saving water in our daily use will help keep the water available for other animals and plants in the future. Some ways to **conserve** water are: when wash-ing dishes by hand, don't let the water run while rinsing; fill one sink with wash water and the other with rinse water; adjust sprinklers so only your lawn is watered and not the house, sidewalk, or street; run your clothes washer and dishwasher only when they are full (you can save up to 1,000 gallons a month); water your lawn and garden in the morning or evening when temperatures are cooler to minimize evaporation; collect the water you use for rinsing fruits and vegetables, then reuse it to water house-plants; and shorten your shower by a minute or two and you will save up to 150 gallons per month.

Preparation: Review the If I Had a Wish for Water PowerPoint ahead of time and have it loaded before the lesson begins.

Materials:

- If I Had a Wish for Water PowerPoint
- Many Uses for Water Datasheet
- Water For Us All T-Chart
- Exit Slip
- Exit Slip Sample

Vocabulary:

- **Conserve -** to use wisely; to save
- **Wetland** - A low-lying land saturated with moisture, such as a marsh or swamp.

Procedure:

1. Recap of previous lesson (Lesson 2): Ask students to recall the four things that all habitats provide (food, water, shelter, and space). These are the basic needs for all living things. Tell them that today we will focus on one of these needs: water.
2. Tell the students that we are going to talk about how important water is to the Everglades, and to us!
3. Using the attached T-Chart as an example, create a T-Chart on the board and discuss with them the many ways we use water for things each day of our lives: we drink it, bathe in it, wash our clothes and cars, water our gardens and lawns, and use it to help ourselves cool down with swimming pools, amusement parks, and sprinklers.
   *T-Charts are graphic organizers students can use to compare and contrast ideas.
4. Again using the T-Chart, talk to the students about where our water in Florida comes from. Students may say the "rain, the tap, ponds, or even "the ocean." Discuss with students that ocean water is salty, so it is not a good source of drinking water). There are many places we get our water from, but one of the most important is the Everglades!
5. Pass out the Many Uses for Water Datasheet.
6. Complete the handout with your students, or have them complete it and review with them afterwards.
7. They will be drawing lines from each of the animals using water to the match of the humans using water (the matching answers are: raccoon washing: hand washing, pelican fishing: children fishing, squirrel drinking: child drinking, manatee swimming: child swimming)
8. Review the big idea that the Everglades is the primary source of water for us all in southern Florida - the many different animals, plants, and us!
9. Remind the students that in southern Florida, we all share the same water source!
10. Discuss that this means we have to share the water with all living things if we want the Everglades (and us too) to remain healthy!
11. Ask the students to think of some ways that we can conserve (save) water or make better use of the water we use daily.
12. Tell the students that you have a book that talks about this - a young person having a wish that people did just this, conserve water.
13. Read If I Had a Wish for Water PowerPoint to the class. Discuss each wish in the book and how the illustrations support the understanding of the text.
14. After reading, ask the students if they can think of any wishes they might have for water. Have them draw a picture and write an expository text about their wish for water. When complete – make a "banner" by taping pictures to a piece of yarn or ribbon and display around the room, or display on a bulletin board. You can also put the drawings all together in a "class book".

Assessment:

1. Exit Slip – Name one way you use water and one way wildlife uses water. Name one way you can help save water.
2. Prompt: If you had a wish for water – what would it be? Have them draw a picture and write an expository text about their wish for water.

Resources:

FAU/Pine Jog Environmental Education Center.

Toth, S. (1998). If I Had a Wish for Water. Tallahassee, FL: Florida State University.

Don't Feed the Gators!

Grade Level: 2nd

Objective:

Students will be able to:

- Explain two reasons why American alligators are important to the Everglades.

Standards:

- SC.2.L.17.2 - Recognize and explain that living things are found all over Earth, but each is only able to live in habitats that meet its basic needs.
- SC.2.L.17.1 - Compare and contrast the basic needs that all living things, including humans, have for survival.
- LAFS.2.SL.2.6 - Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 2
- Fundamental Concept 5
- Fundamental Concept 7

Duration: 60 minutes

At A Glance:

Students will read a book on the importance of American alligators and act out a short play which demonstrates the dangers of feeding wild animals.

Background:

Animals in southern Florida are accustomed to their natural environment. They are wild animals with the ability to exist without human intervention. It is detrimental to the American alligator for humans to feed and/or change their natural environment. In areas of southern Florida where American alligators are found, we occasionally hear about "problem gators" that have attacked dogs and sometimes people. In most of those cases, it is the people who fed the American alligator that are the problem. The American alligators soon begin to associate people with food. When people feed American alligators, they are actually doing it more harm than good. The American alligator no longer gets the balanced diet it would if it were getting its own food in the natural environment. Also, once the American alligator gets used to being fed by humans, it will no longer be able to find food on its own.

Preparation:

1. Locate a copy of Who Lives in an Alligator Hole? by Anne Rockwell from your media center or public library.
2. Gather any props that you would like to use such as masks, or puppets to enhance activity (optional).
3. Bring up What is the Everglades? PowerPoint before lesson begins.
4. Bring up the Alligator Hole in Florida Everglades video before starting the lesson.

Procedure:

1. Ask students if they have ever heard of the **Everglades**. Discuss what they think they know about the Everglades and why they might be talking about it today.
2. Show What is the Everglades? PowerPoint. The slides have one slide with just a picture of the animal or plant followed by a slide with the name of the animal or plant so that the students can participate by trying to guess the name of the animal or plan. Ask them what they observe about each animal or plant picture before identifying it for them. **Note:** There is information on the PowerPoint about the animals/plants. Use your discretion to determine how much information on each one to include during the lesson.
3. Have the students see if they can guess the name of the animal before you show them the name.
4. Tell students that although the Everglades is home to many special animals, we are going to talk about one of them in particular for the next few lessons – one of the most important animals, the American alligator!

Materials:

- What is the Everglades? PowerPoint
- Please Don't Feed the Gators play
- Any props to enhance lesson (puppets, masks, etc.) - optional
- Who Lives in an Alligator Hole? by Anne Rockwell
- Chart Paper or White board for the K-W-L chart

Vocabulary:

- **Alligator hole** - A hole that an American alligator makes that helps other wildlife survive because of the water that collects in the hole.
- **Everglades** - A natural region in southern Florida containing many different types of habitats, plants and animals.

5. Begin a K-W-L chart with the students. Begin with what they know or think they know and what they wonder about American alligators. A K-W-L chart is a graphic organizer used to help students identify what they **K**now, **W**ant to Learn, and **L**earned after the lesson. Students will complete the L portion of the chart at the end of this lesson as part of their assessment. **Note**: Learn more about the use of a K-W-L chart.
6. Read aloud Who Lives in an Alligator Hole? by Anne Rockwell.
7. After reading the book, discuss with the students the following:
    - What were some of the major events in the book? Possible response "During the dry season alligators dig holes that fill with water, many living things come to these alligator holes to eat and drink, alligators became endangered and on their way to extinction, laws were passed to protect alligators and other endangered species."
    - What are some of the animals that use the alligator hole?Possible response "turtles, fish, pig frogs and many wading birds, such as the Great Blue Heron and Wood Stork."
    - Why do they think American alligators are important to have in the Everglades? Possible response "American alligators are a keystone species that helps other animals and plants survive during the Everglades dry season."
8. Show the students the YouTube video of the **alligator hole**.
9. Discuss the video with the students, having them tell you their observations of the different animals that were in the alligator hole, or what animals they think might visit it later. Students should observe many alligators and a variety of birds in the alligator hole video and make inferences as to what might visit the alligator hole based on the reading.
10. Ask the students if they think it is a good idea to feed American alligators in the wild and why or why not. Alligators are a protected species and it is illegal to feed or harass alligators. Alligators who are feed by humans lose their innate fear and can become a danger to society.
11. Discuss with the students that since we know some of the important roles the American alligators play in the Everglades, taking care of them is important. Ask how they think we should take care of them. We can take care of alligators by not feeding them and sharing with others the important role alligators play in the Everglades.
12. Have two students act out the Please Don't Feed the Gators! play for the class (printed version provided or available online).
13. After the play, discuss with students the issues with feeding wild animals such as the American alligator.
14. This is an opportunity to discuss the fine balance of nature and how they can protect nature by not doing certain things, like feeding wild animals.
15. Complete the "L" of the K-W-L chart together as a class. This will provide an opportunity to address any misconceptions and to reinforce the idea that living things find what they need to survive in their specific habitats. For example: At first I thought Alligators were useless, but now I know they help other animals survive during the dry season. At first I thought I was helping the alligator by giving it food, but now I know feeding alligators is dangerous.

16. Have students draw an illustration of an alligator hole with at least three other animals that use he alligator hole and label each animal (see Assessment).
    - Sample sentence – The Alligator is a keystone species. The hole that an American alligator makes helps other wildlife survive because of the water that collects in the hole.

Assessment:

1. Complete the "L" of the K-W-L chart with students contributing what they have learned about American alligators. For example: At first I thought Alligators were useless, but now I know they help other animals survive during the dry season.
2. Have students draw a picture of an alligator hole with at least three other animals that use the alligator hole in the picture and label each animal.
3. Have students write a summary sentence about the importance of alligator holes underneath the picture.

Resources:

(2013, February 12). Alligator Hole in Florida Everglades. [YouTube]. Retrieved from http://www.youtube.com/watch?v=95G2_H299pI

FAU/Pine Jog Environmental Education Center.

Everglades National Park (2006). Please Don't Feed the Gators. In *The South Florida National Parks Activity Guide for 4-6 Grade Teachers* (Wildlife Activities Section). Retrieved from http://www.nps.gov/ever/forteachers/4-6-activity-guide.htm

Rockwall, A. (2006). Who Lives in an Alligator Hole? New York, NY: HarperCollins.

Everglades Seasons

Grade Level: 2nd

Objective:

Students will be able to:

- Explain the difference between the Everglades wet/dry season.
- Explain why American alligators dig alligator holes during the dry season.
- Name one way the American alligator helps other animals survive during the dry season.
- Explain what a keystone species is and why they are important to the environment.

Standards:

- SC.2.L.17.1 - Compare and contrast the basic needs that all living things, including humans, need for survival.
- SC.2.L.17.2 - Recognize and explain that living things are found all over Earth, but each is only able to live in habitats that meet its basic needs.
- LAFS.2.SL.1.2 - Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 2
- Fundamental Concept 5
- Fundamental Concept 7

Duration: 60 minutes

At A Glance:

Students will act out an ecodrama in an alligator hole during the dry season. Each student will play a role of an animal that depends on the alligator hole. Students will identify the American alligator as a keystone species that enables other species to survive.

Background:

There are two seasons in southern Florida: the wet and dry season. During the wet season (May-November) rain falls almost every day and surface water levels rise dramatically. During the dry season (December-April), the rains diminish and surface water levels drop. Wildlife becomes concentrated in areas where water remains. The American alligator uses its powerful tail, jaw and feet to push away dirt and vegetation to keep a pool of water open throughout the dry season. Alligator holes become one of the few remaining wet habitats during the dry season. As a result, a variety of species concentrate and visit the alligator holes during the dry season to get water to drink, to live and for some, to eat the other animals that gather there. The American alligator is a keystone species that plays a unique role in the Everglades by enabling other species to survive the dry season.

Preparation:

1. Gather any props that you would like to use such as masks, or puppets to enhance the activity.
2. Assemble the animal necklace signs using yarn or string in order to designate student roles.

Procedure:

1. Ask your students if they know the different Everglades seasons.
2. Ask if they know how many seasons the Everglades has. Let them know that the correct answer is TWO!
3. Discuss that a lot of people will say that there are FOUR seasons: summer, fall, winter, and spring! However, in the Everglades there is not really the bitter cold frost of winter and we hardly even notice the changing color of leaves in the fall. Instead, what we can notice is the changing of the water levels.
4. The wet season starts around the middle of May and continues through to November with the last major storms. The wet season is followed by a period of very little to almost no rain. This is the start of our second season, the dry season.
5. The dry season, runs from December through April. During this season, everything starts to dry up in a short amount of time.
6. Have students recall and record important information they learned from the read-aloud, Who Lives in an Alligator Hole? using a T-Chart. Later, this chart will be used to recall information from the ecodrama

Materials:

- Any props to enhance lesson (puppets, masks, etc.) - optional
- Yarn or string
- Signs that have the pictures of the animals on them - American alligator (1), Florida panther (1), Great Blue Heron (1), bluegill (1/2 of class), bobcat (1), white-tailed deer (1), river otter (1), Everglades racer (1), pig frog (4)
- Who Lives in an Alligator Hole? by Anne Rockwell (optional, if re-reading with group)
- Everglades Season Ecodrama
- T-Chart

Vocabulary:

- **Alligator hole** - A hole that an American alligator makes that helps other wildlife survive because of the water that collects in the hole.
- **Dry season** - In southern Florida, December-April, the rains diminish and surface water levels drop.
- **Wet season** - In southern Florida, May-November, where rain falls almost every day and surface water levels rise dramatically.
- **Keystone Species** - is a plant or animal that plays a unique role in the way an ecosystem functions.

so that students can compare information from Who Lives in an Alligator Hole? with the ecodrama text. If time allows, you can reread the book in order to refresh their memories about the topic. *T-Charts are graphic organizers students can use to compare and contrast ideas.

7. Ask the students why they think American alligators are important to have in the world. Possible response - Alligators are a keystone species, a keystone species changes its environment for its own use, like the alligator making an alligator hole that helps other plants and animals.
8. Discuss with them some of the reasons American alligators are so important to the Everglades. Make sure to emphasize how important this water in the alligator hole is to other animals to live in and drink from. Conclude discussion by addressing the misconception that alligators are "bad" animals and do not contribute to the health of the Everglades.
9. Hand out a copy of the Everglades Seasons Ecodrama to each student and share as a class read aloud. Have students discuss any new information about American alligators and alligator holes.
10. Assign the student roles for the Everglades Season Ecodrama. Use the pre-made animal sign necklaces to designate the roles. Assign about one-half of the group to be bluegills. The remaining one-half of the class should include an American alligator (1), Everglades racer (1); a pig frog (up to 4); a river otter (1); a white-tailed deer (1); a bobcat (1); Great Blue Heron (1); and a Florida panther (1). Give appropriate signs to each animal actor.
11. Ask the students to act out the following narration of the Everglades Season Ecodrama with you as the narrator.
12. Bring the students back together as a class. Summarize what they acted out.
13. If time allows, give students different roles and have them act out the scenario again.
14. Have students complete their T-Chart by adding information gained from the ecodrama. Using their T-Charts have students compare and contrast the key ideas from Who Lives in an Alligator Hole? and from the ecodrama.
15. Discuss whether they find it would be difficult to survive by relying on an alligator hole for water during the dry season.
16. Wrap-up: Have the students answer the following questions in their science notebooks:
    - What are the two seasons that occur in the Everglades? (Wet and dry.)
    - Why are Alligators important to other wildlife? (As a keystone, they change their environment and provide for other species.)
    - What does the American alligator provide for wildlife? (Water and a place to live.)
    - What does the wildlife provide for the American alligator? (Food.)
    - Why do American alligators dig these alligator holes? (To create a home.)
    - How do alligator holes help other animals? (Provide water and food.)
    - How can we help protect the American alligator?

Assessment:

Ask the students to:

1. Name the two seasons we have in the Everglades.
2. Write a personal narrative about why American alligators are important to other wildlife.

Resources:

FAU/Pine Jog Environmental Education Center.

Wet Season-Dry Season: Fish Relay

Grade Level: 2nd

Objective:

Students will be able to:

- Describe the wet/dry seasons of the Everglades.
- Describe what happens to aquatic life as the waters in the Everglades dry.
- Explain why wading birds nest during dry season.

Standards:

- SC.2.L.17.2 - Recognize and explain that living things are found all over Earth, but each is only able to live in habitats that meet its basic needs.
- SC.2.N.1.3 - Ask "how do you know?" in appropriate situations and attempt reasonable answers when asked the same question by others.
- LAFS.2.W.3.8 - Recall information from experiences or gather information from provided sources to answer a question.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 2
- Fundamental Concept 5
- Fundamental Concept 7

Duration: 60 minutes

At A Glance:

Students will be learning about water levels and how they affect the amount of food available for wading birds, such as the Wood Stork. Students will run a relay race imitating parent Wood Storks feeding their babies; one team during the wet season, the second team during the dry season.

Background:

There are two seasons in southern Florida: the wet and the **dry season**. During the **wet season** (May-November) rain falls almost every day and the surface water levels rise dramatically (see Fish Relay Visual for reference). This high water flows through the Everglades and provides expanded habitat for aquatic life. During the dry season (December – April) the rains diminish and the surface water drops. Aquatic life concentrates in small pools, making hunting easier for wading birds. The Wood Stork is an example of a wading bird adapted to the wet/dry season. Wood Storks nest during the dry season when food is easier to catch. During high water level years without a dry season, the Wood Stork will either not nest or nest late. If water levels fluctuate due to natural or managed alteration, Wood Storks may abandon established nests because they are unable to find the quantities of food needed to feed their young. A Wood Stork nestling requires about 36 pounds of food during the 60-65 days it is dependent on its parents.

Preparation:

1. Make copies and cut out fish and Wood Stork pictures beforehand.
2. Choose a large area to conduct the relay that will emphasize the difference of a concentrated food source versus a widely dispersed food source.
3. Load the Wood Stork video.

Procedure:

1. Ask students to recall what they have learned about the wet/dry seasons in the Everglades.
2. Explain to students how important water is to the Everglades and that living things depend on a fine balance. Too much rain, or too little rain, and wildlife could suffer.
3. Discuss how, just like the American alligator makes alligator holes, other animals depend on water for survival and they need to have water the whole year, in both wet and dry seasons.
4. In this lesson, students will be learning about water levels and how they affect the amount of food available for wading birds in the Everglades. The bird they look at during this lesson is the Wood Stork.
5. First, have your students meet the Wood Stork! This video will introduce your students to the Wood Stork

Materials:

- Fish cutouts (approximately 40 fish)
- Wood Stork parent pictures (2)
- Wood Stork nest pictures (2)
- Fish Relay Visual of wet vs. dry season
- Watch with a second hand or stopwatch

Vocabulary:

- **Dry season** - In southern Florida, December-April, the rains diminish and surface water levels drop.
- **Wet season** - In southern Florida, May-November, where rain falls almost every day and surface water levels rise dramatically.

and provide background on the Wood Storks habitat, roosting and feeding patterns.

6. Based on the video, ask your students, "What are the basic needs of a Wood Stork?" If needed, prompt students to describe what they saw in the video. Wood Storks need fish, water, roosting habitat, and food for young.
7. *Setting up for the fish relay race:* Divide the group into two teams.
8. Explain to the students that they will be parent birds feeding their babies in the nest (put pictures of nests on a flat surface so that both teams can have enough space to run to.) The "feeding" is done as a relay race.
9. Explain to the students that one team of Wood Stork parents will be raising and feeding their young during the wet season and the other team of Wood Stork parents will be raising and feeding their young during the dry season.
10. Ask students to form a hypothesis (or make a claim) about which team of Wood Stork parents will have an easier time raising their young.
11. Explain that the first team will be Wood Storks raising their young during the wet season when the aquatic life is dispersed throughout the marsh. Spread all the fish out to represent their expanded habitat. Make sure to spread the fish out so that it takes some time for the Wood Stork parents to collect them and bring them back to the nest.
12. *To start the relay:* Each team lines up next to their respective nest. Each team member runs to pick up a fish and returns it to the nest picture, to feed its baby. Once the first student gives the baby its food, the next Wood Stork (person in line) goes. This will continue until all the fish are picked up. Using the stopwatch, make sure to record the time in a data chart for each team.
13. Conduct three trials for each team and record the times for each trial for both the wet season team and the dry season team. Calculate the average for all 3 trials and record it in the data table. Tip: Use the same unit of measurement.
14. Now explain that the second team of Wood Storks will be raising their young during the dry season. The fish have become concentrated in areas like alligator holes. Place the fish in a smaller area and time the relay for this team.
15. The dry season team should complete the relay race in a shorter time.
16. As a class, construct a data table on the board or chart paper that shows the times recorded for each trial. Ask students to revisit their hypothesis or claim and use the data in their data table to determine if the evidence supports their hypothesis/claim.

SEASONS	TRIAL 1	TRIAL 2	TRIAL 3	AVERAGE
Wet Season				
Dry Season				

17. As a review, play the Wood Stork video that shows more information about how they roost and their basic survival needs in the Everglades.

18. Wrap-up: Ask the students if they had to choose whether to raise their young during the dry season or during the wet season, which would they choose and why?
19. Conclude by discussing with the students that Wood Storks are very "smart". They always choose to nest and raise their young during the dry season when fish are more concentrated in pools of water.
20. Have students write a short narrative about the basic needs of a Wood Stork and how the Everglades is critical to the survival of the Wood Stork, to demonstrate mastery of the concepts (see Assessment).
    Possible sentence starters:
    1. I was really surprised to learn that _____.
       I was really surprised to learn that there are only two seasons in the Everglades.
    2. My data shows that _____.
       My data shows that during the dry season a Wood Stork can find food easier and quicker because it is concentrated in a pool of water.

Assessment:

1. Have students write a personal narrative that defines how the Everglades' wet season and dry season affect the Wood Stork.
2. Have the students illustrate their narrative with two pictures, one depicting the wet season and the other the dry season.

Resources:

Everglades National Park (2006). Fish Relay. In The South Florida National Parks Activity Guide for 4-6 Grade Teachers (Wildlife Activities Section). Retrieved from NPS

FAU/Pine Jog Environmental Education Center.

Classifying Everglades Animals and Their Habitats

Grade Level: 3rd

Objective:

Students will be able to:

- Classify Everglades animals into the six major animal groups based on their physical characteristics and/or behaviors.
- Name five Everglades habitats.
- Name two animals that live in each habitat.

Standards:

- SC.3.L.15.1 - Classify animals into major groups according to their physical characteristics and behaviors.
- SC.3.N.1.1 - Raise questions about the natural world, investigate them individually and in teams through free exploration and systematic investigations, and generate appropriate explanations based on those explorations.
- LAFS.3.W.1.2 - Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- LAFS.3.SL.1.1 - Engage effectively in a range of collaborative discussions with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.
- LAFS.3.SL.1.3 - Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.

At A Glance:

Students will learn that animals can be classified into six major animal groups and become familiar with Everglades animals in these groups. Students will also learn about the five different habitats of the Everglades where these animals live.

Background:

Within the Greater **Everglades** system is a collection of numerous **habitat** types. A habitat is a home for plants and/or animals that provides food, water, shelter, air, sunlight and space. This activity will develop the students' knowledge of the differences between the habitat type as well as the different organisms that live in each one. The formation of the limestone foundation of the Everglades determines where a certain habitat is found. Therefore, pockets and islands of the different habitats are scattered throughout the Everglades. The water level and water availability determine the vegetation of a particular habitat and this in turn determines the wildlife found there. Some wildlife species live in only one type of habitat, while others move from one habitat to another depending on the availability of food, water, shelter, and space.

Five of the major habitat types found in the Everglades are: **sawgrass marshes**, **hardwood hammocks**, **pinelands**, **cypress swamps**, and **mangrove swamps**.

The sawgrass marsh and cypress swamp are both wet habitats, with fresh water flowing through them primarily during the wet season. These two habitats differ in that the sawgrass marsh is dominated by sawgrass and other aquatic plants with no trees so it is open and sunny. The cypress swamps are dominated by cypress trees that create a canopy allowing only some sunlight to reach other aquatic plants that grow in the swamp understory. Today much of this land that comprised these habitats has been drained and cleared.

Hammock and pineland habitats are high and dry. Generally, hammocks are considered relatively small tree islands. A hardwood hammock is a dense stand of broad-leafed trees that grow on a natural rise of only a few inches in elevation. In the cypress swamps and marshes, the seasonal flow of water helps give these hammocks a distinct aerial teardrop shape. Pinelands may be extensive and drier. Pinelands are dominated by slash pines.

Mangroves are associated with **brackish** water. There are three main types of mangroves: red, black and white. The term "mangrove" is used to identify several species of salt-tolerant trees that thrive amidst the harsh growing conditions of the coast. Mangrove habitat serves as a valuable nursery for a variety of recreationally and commercially important

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 5

Duration: 120 minutes

Materials:

- Everglades Animals and Their Habitats PowerPoint
- Everglades Animal Cards (5 sets)
- Everglades Habitat Cards (1 set)
- Major Animal Group Cards (5 sets)
- Answer Key for Animal Habitat Cards
- Spider Map
- Habitat Reading Passages

Vocabulary:

- **Amphibian** - any of a class of cold-blooded vertebrates that are able to live both on land and in the water.
- **Arthropod** – any invertebrate animal having jointed legs, a segmented body and an exoskeleton, including insects, spiders and crustaceans.
- **Bird** – any of a class or warm-blooded egg-laying vertebrates with a body covered with feathers and forelimbs modified as wings.
- **Brackish water** - Fresh water mixed with salt water
- **Cold-blooded** – animals whose body temperature will be the same as their surroundings.
- **Cypress swamp** - The most common and widespread of the Everglades freshwater swamps, dominated by cypress trees.
- **Everglades** - A natural region in southern Florida containing many different types of habitats, plants and animals.

marine species. During the dry months, wading birds congregate here to feed and nest. And during the summer months, these mangrove forests provide the first line of defense against the howling winds and storm surge of hurricanes.

In all five habitats, you can find animals from all six major animal groups: **mammals**, **birds**, **fish**, **reptiles**, **amphibians**, and **arthropods**.

Preparation:

1. Prepare Everglades Animal Cards (5 sets) and Major Animal Group Cards (5 sets), Everglades Habitat Cards (1 set), and Habitat Reading Passages (1 per student or group). You will not need the plant cards for this lesson.
2. Print spider maps for each student.
3. Review Everglades Animals and Their Habitats PowerPoint and PowerPoint notes before showing to students. Notice that the plant slides have been hidden. This is because this lesson focuses only on Everglades animals and what animal groups they belong to. In Lessons 2 and 3, plants are introduced.

Procedure:

Part One: Everglades Animals and Their Habitats

1. Assess prior knowledge of the Everglades by asking students what they know about the Everglades. You might want to put their responses on the board as a word web.
2. Tell students that today they will be learning about some fascinating Everglades animals and their habitats.
3. Provide the Habitat Reading Passages to students (either individually or in small groups). There are 5 habitats in this lesson. Have students answer the comprehension questions at the end of each passage to identify important details of each habitat. Lead a class discussion about the important details of each habitat and record class responses.
4. Divide students into groups of four and give each group a set of Everglades animal cards. Ask students to sort the cards into different groups based on their observations.
5. After students have completed their groupings, ask each group to explain how they grouped their cards.
6. Now tell students that they will learn more about these Everglades animals, their characteristics, and where they live in the Everglades.
7. Before beginning the PowerPoint, explain to the students that they will be learning about the six major animal groups and their physical characteristics: amphibians, birds, fish, arthropods, mammals and reptiles. They will also learn about animals from all these groups that live in five different Everglades habitats.
8. Explain to students that as they view the PowerPoint, you will ask them to describe from the picture the physical characteristics for each animal and to identify which animal group each Everglades animal belongs to.
9. Please refer to PowerPoint notes section for each slide; this PowerPoint has a vast amount of information. To help students organize their thoughts, begin with a spider map. Explain to the students that they will use a spider map(s) to organize the animals that live in each habitat. The main heading for each spider map will be the habitat. Note: You can learn more about the use of a spider map.

- **Fish** – any of a class of cold-blooded vertebrates that live and breathe in water and typically have long, tapering scaly bodies and limbs developed as fins, and a vertical tail fin.
- **Habitat** - The natural environment of an animal or plant.
- **Hardwood hammock** - A dense group of broad leafed trees that grow on only a few inches in elevation.
- **Invertebrate** – any animal lacking a backbone or spinal column, such as an arthropod.
- **Mammal** – any of a class of warm-blooded vertebrates that include human beings and all other animals that nourish their young with milk produced by mammary glades and have skin usually with some hair.
- **Mangrove swamp** - a swamp in the Everglades that is dominated by mangrove trees. Mangrove trees are salt-tolerant trees that thrive amidst the harsh growing conditions.
- **Pinelands** - A forested area where pine trees and saw palmetto dominate.
- **Reptile** – any of a group of cold-blooded, air-breathing vertebrates (such as snakes, lizards, turtles and alligators) that usually lays eggs and has skin covered with scales or bony plates.
- **Sawgrass marsh** - A wetland where sawgrass, a plant that has spiny, serrated leaves, is the most dominant plant found.

10. Show PowerPoint with different habitats of the Everglades and some of the representative animals that live in each habitat. Have students recall important details for each habitat as you work through the PowerPoint. As students write the animal's name on the spider leg for each habitat, ask students to describe the animal's physical characteristics. Based on those characteristics, which animal group does each animal belong to? Note: The animal slides appear first with just a picture of the animal followed by the name of the animal so that the students can participate by trying to guess the name of the animal.

Part Two: Animal Classification

1. After completing the PowerPoint, give each group of four students a set of Major Animal Group 'heading' cards: Mammal, Bird, Fish, Reptile, Amphibian, and Arthropod and ask them to now sort the Everglades animal cards under the proper animal group.
2. Once students have completed their sorting, discuss as a class, the classification of these Everglades animals, reviewing the characteristics they used to determine into which animal group each animal belonged.
3. Next, place the habitat cards (mangrove swamp, pinelands, sawgrass marsh, cypress swamp, and hardwood hammock) in the front of the room with tape or magnets on the board.
4. Give one Everglades animal card to each student and have them think about which habitat their animal belongs.
5. Have each student come up one by one and present their animal by saying, "I am a/an _____ and belong in the animal group, _____ and I live in the _____. Have the student give the information they remember for their animal and why they think it belongs in the habitat they chose.
6. Have them place the animal with the habitat card. Use magnets or tape to place them underneath the habitat card. At the end, all the "correct" animals should be with the "correct" habitats. For some animals, there is more than one correct habitat (see key for answers). You may have to help them with the information (from the PowerPoint) on the animal.
7. Wrap-up: Discuss the following questions with the students:
   - What are some of the characteristics we used to sort our Everglades animals into animal groups? (Answers will vary, but should include characteristics such as vertebrate or invertebrate; cold- or warm-blooded; nurse their young; have wings, etc.)
   - Does each habitat provide a home for all the animal groups? (Students should observe that every animal group is represented in each habitat except for fish, which are not found in the uplands habitats: Pinelands and Hardwood Hammocks.)
   - Do some animals depend on more than one habitat? (Some animals may travel to different areas to obtain all their needs. For example, a grey fox might have its den in the pinelands habitat, but will venture to the hardwood hammock to gather food. Animals are not restricted to any one "type" of habitat to get what they need if other types of habitats are nearby.)
   - Are all the different habitats necessary? (Yes, different habitats support different animals. For example, an American alligator needs a different habitat than a Wood Stork to get its needs of food, water, shelter, and space.)

- **Vertebrate** - any animal distinguished by the possession of a backbone or spinal column, including mammals, birds, reptiles, amphibians, and fishes.
- **Warm-blooded** – animals that can make their own body heat even when it is cold outside.

- What makes the habitats different? (Elevation, water levels, vegetation, etc.)

Assessment:

1. Have students sort the Everglades animal cards into the six major animal groups: amphibian, bird, fish, arthropod, reptile, and mammal.
2. Have students select an Everglades habitat of their choice and draw it with at least two animals that live in this habitat; label each animal with its name and animal group. Have them write 2-3 summary sentences about their habitat drawing.

Resources:

Everglades National Park (2006). Finding Home: Everglades Habitats. In Everglades ABC's- Activity Guide for Grades K-3 Teachers (Section 5: Second Grade Activities). Retrieved from http://www.nps.gov/ever/forteachers/k-3guide.htm

FAU/Pine Jog Environmental Education Center.

Classifying Everglades Plants and Their Habitats

Grade Level: 3rd

Objective:

Students will be able to:

- Identify plants of the Everglades using a dichotomous key.
- Identify factors that make Everglades habitats different.

Standards:

- SC.3.L.15.2 - Classify flowering and nonflowering plants into major groups such as those that produce seeds, or those like ferns and mosses that produce spores, according to their physical characteristics.
- LAFS.3.RI.1.3 - Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 5

Duration: 60 minutes

At A Glance:

Students will identify plants of the Everglades using a dichotomous key and become familiar with the five different habitats of the Everglades where these plants live.

Background:

Within the Greater **Everglades** system is a collection of numerous **habitat** types. A habitat is a home for plants and/or animals that provides food, water, shelter and space. This activity will develop the students' knowledge of the differences between the habitat type as well as the different organisms that live in each one. The formation of the limestone foundation of the Everglades determines where a certain habitat is found. Therefore, pockets and islands of the different habitats are scattered throughout the Everglades. The water level and water availability determine the vegetation of a particular habitat and this in turn determines the wildlife found there.

Five of the major habitat types found in the Everglades are: **sawgrass marshes**, **hardwood hammocks**, **pinelands**, **cypress swamps**, and **mangrove swamps**.

The sawgrass marsh is a low, wet area, with fresh water flowing through it primarily during the wet season. Sawgrass is not a "true" grass, but actually a member of the sedge family, characterized by sharp teeth along the edges of each blade. Sawgrass once covered the northern portion of the Everglades, growing to heights of over 9 feet (2.7 m) tall on the rich, dark peat soils. However, today much of this land has been drained and cleared and is used to grow sugarcane. Today sawgrass is found through-out the southern and central regions of the Everglades.

Hammock and pineland habitats are high and dry. Generally, hammocks are considered relatively small tree islands. A hardwood hammock is a dense stand of broad-leafed trees that grow on a natural rise of only a few inches in elevation. In the cypress swamps and marshes, the seasonal flow of water helps give these hammocks a distinct aerial teardrop shape. Pinelands may be extensive and drier. Pinelands are dominated by slash pines.

Mangroves are associated with **brackish** water. There are three main types of mangroves: red, black, and white. The term "mangrove" is used to identify several species of salt-tolerant trees that thrive amidst the harsh growing conditions of the coast. Mangrove habitat serves as a valuable nursery for a variety of recreationally and commercially important marine species. During the dry months, wading birds congregate here to feed and nest. And during the summer months, these mangrove forests provide the first line of defense against the howling winds and storm surge of hurricanes.

Materials:

- Everglades Plants PowerPoint
- Plants of the Everglades ID Cards
- Dichotomous Key Worksheet
- Dichotomous Key Worksheet Answer Key
- Habitat Reading Passages - optional

Vocabulary:

- **Brackish water** - Fresh water mixed with salt water.
- **Cypress swamp** - The most common and widespread of the Everglades freshwater swamps, dominated by cypress trees.
- **Everglades** - A natural region in southern Florida containing many different types of habitats, plants and animals.
- **Flowering plants** - A plant that produces flowers, fruits, and seeds.
- **Habitat** - The natural environment of an animal or plant.
- **Hardwood hammock** - A dense group of broad leafed trees that grow on only a few inches in elevation.
- **Mangrove swamp** - a swamp in the Everglades that is dominated by mangrove trees. Mangrove trees are salt-tolerant trees that thrive amidst the harsh growing conditions.
- **Nonflowering plants** - Plants that do not use flowers to reproduce; some use spores to reproduce and some use seeds to reproduce.
- **Pinelands** - A forested area where pine trees and saw palmetto dominate.
- **Sawgrass marsh** - A wetland where sawgrass, a plant that has spiny, serrated leaves, is the most dominant plant found.

Some wildlife species live in only one type of habitat, while others move from one habitat to another depending on the availability of food, water, shelter, and space.

Dichotomous Keys: A dichotomous key is used by scientists to identify objects (both living and non-living). The key organizes a large set of items into a structure that breaks them down into smaller, more accessible subsets, with many keys leading to the smallest available classification unit. In the Dichotomous Key, students will be able to identify **flowering plants**, plants that produce flowers, fruits, and seeds, and **nonflowering plants**, plants that do not use flowers to reproduce.

Preparation:

1. Print and cut Plants of the Everglades ID Cards (one set for each group - 6 groups total).
2. Print Dichotomous Key Worksheet (one for each group).
3. Review Everglades Plants PowerPoint and the notes section of each slide. This PowerPoint has a vast amount of information.

Procedure:

1. Before beginning the Everglades Plants PowerPoint, tell students that today they will be learning about the Everglades, its habitats, and some of the plants that characterize each habitat. Note: If you did not implement Grade 3, Lesson 1: Everglades Animals and Their Habitats, provide the Habitat Reading Passages to students (either individually or in small groups).
2. Show students the satellite map of the Everglades, reminding them of where the Everglades is located geographically (slide 2). Point out some of the Everglades landmarks such as Lake Okeechobee, Big Cypress Reserve, the Water Conservation areas, and Everglades National Park.
3. Ask students why scientists classify objects into groups (slide 3).
4. Discuss plant classification and how plants can be classified into two groups: nonflowering and flowering plants (slides 4-7).
5. Explain to students what a dichotomous key is and that scientists use them to help classify things according to their characteristics (slide 8).
6. Demonstrate how a dichotomous key works by walking them through the emoji dichotomous key (slide 9). Tell students: "Let's try to name each of these emojis using this dichotomous key. Let's start with the emoji at the top left. First, we go to question #1 and answer the question yes or no; since the answer is yes, we go to question #2. Since the answer to question #2 is yes, we know this emoji's name is Susie. Now let's move to the next emoji and back to question #1 and go through the same process." Note: Follow this process for each emoji, always begin with question #1. If you use a SMART Board in your classroom to show the PowerPoint, have the students come up and write the name of each emoji as they identify it.
7. Show the final Emoji Answer Key Slide (slide 15) and then slide 16.
8. Divide the class into groups of 4. Pass out a set of Plants of the Everglades ID Cards and Dichotomous Key Worksheets to each group.
9. Tell each group that they are going to identify several plants of the Everglades using a dichotomous key. To begin, they will choose a Plant Card and read the information on the card. They will then work their way through the key, starting at 1 and reading through each statement. After they choose a statement that goes with the plant they are trying to identify, it will lead them to either the name of the plant or a new set of statements.

10. Show the remaining PowerPoint slides with the five different habitats of the Everglades and some of the representative plants that live in each habitat. The notes section of each habitat and each plant slide has a lot of information. Please share with them as you see fit. Ask students what they observe about each habitat before describing it for them. Plant slides will appear first without their name shown to let students test their knowledge of the plant names they learned using the Dichotomous Key. **Note**: There are three plants in these slides that will appear first with their name because they were not part of the Dichotomous Key: cabbage palm, saw palmetto, and sawgrass. Be sure to take time to ask students to make observations about these plants. Tell students that although they cannot observe flowers in these pictures, they are all flowering plants. Question 4 of the worksheet will ask about these plants.
11. Wrap-up: Discuss the questions from the student Dichotomous Key Worksheet.

Assessment:

1. Have students draw an Everglades habitat of their choice. Label the features of each habitat that support the organisms that live there. Have the students use the dichotomous key as a guide on which features to include in each habitat. Draw it with at least two plants that live in each habitat.

Resources:

FAU/Pine Jog Environmental Education Center.

Hurry for a Habitat!

Grade Level: 3rd

Objective:

Students will be able to:

- Name five Everglades habitats.
- Identify three organisms, including plants and animals, that live in each habitat
- Explain that different habitats are needed for different animals' survival.

Standards:

- SC.3.N.1.1 – Raise questions about the natural world, investigate them individually and in teams through free exploration and systematic investigations, and generate explanations based on those explorations.
- SC.3.L .15.1 – Classify animals into major groups (mammals, birds, reptiles, amphibians, fish, arthropods, vertebrates and invertebrates, those having live births and those which lay eggs) according to their physical characteristics and behaviors.
- LAFS.3.W.1.2 - Write informative/ explanatory texts to examine a topic and convey ideas and information clearly.
- LAFS.3.SL.1.1 - Engage effectively in a range of collaborative discussions with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.

At A Glance:

Students will use a relay race activity to reinforce knowledge learned in Lesson 1 and Lesson 2.

Background:

Within the Everglades is a collection of numerous habitat types. A habitat is a home for plants and/or animals and provides food, water, shelter, and space.

A **habitat** can exist in any size and can be as small as a log that is decaying on the forest floor or as large as a vast prairie. Habitats contain both living, and nonliving organisms.

Five of the major habitat types found in the Everglades are: **sawgrass marshes**, **hardwood hammocks**, **pinelands**, **cypress swamps**, and **mangrove swamps**.

Some wildlife species live in only one type of habitat, while others move from one habitat to another depending on the availability of food, water, shelter, and space.

Preparation:

1. Tape one Habitat Card to each box.
2. Review PowerPoint presentation and the notes section of each slide. This PowerPoint reviews the habitats, animals, and plants of the five Everglades habitats.
3. Have one complete set of Everglades Plants and Animal Cards (only one set of Animal Cards were used in Lesson 1).

Procedure:

1. As a review, load the PowerPoint, you may choose to go over the entire PowerPoint or just a few organisms. Have students take out their Spider Map and Dichotomous Key used in Lessons 1 and 2.
    - Name the five habitats we have been learning about - **sawgrass marshes**, **hardwood hammocks**, **pinelands**, **cypress swamps**, and **mangrove swamps**.
    - Describe what makes each habitat different from one another - Have students revisit each Habitat Reading Passage (Elevation, water levels, vegetation, etc.)
    - Does each habitat provide a home for all the animal groups? (Students should observe that every animal group is represented in each habitat except for fish, which are not found in the upland habitats: Pinelands and Hardwood Hammock.)

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 5

Duration: 60 minutes

Materials:

- Everglades Animals, Plants, and Their Habitat Cards
- Key to Everglades Plant and Animal Cards
- 5 boxes or crates with lids
- Habitat Reading Passages

Vocabulary:

- **Cypress swamp** - The most common and widespread of the Everglades freshwater swamps, dominated by cypress trees.
- **Habitat** - The natural environment of an animal or plant.
- **Hardwood hammock** - A dense group of broad leafed trees that grow on only a few inches in elevation.
- **Mangrove swamp** - A swamp in the Everglades that is dominated by mangrove trees. Mangrove trees are salt-tolerant trees that thrive amidst the harsh growing conditions.
- **Pinelands** - A forested area where pine trees and saw palmetto dominate.
- **Sawgrass marsh** - A wetland where sawgrass, a plant that has spiny, serrated leaves, is the most dominant plant found.

    - Can you name one animal and/or plant that belongs in each habitat? In small groups you may have students organize the Everglades Plant and Animal Cards into each habitat using the PowerPoint to guide them.
2. Place the five boxes marked with different habitats of the Everglades in a line with labels facing the group.
3. Group students into small discussion groups.
4. Tell the students that they are going to be handed a card and it is up to them and their group to decide in what habitat the animal or plant belongs. Hand out one card per student. They will receive either a plant or animal card.
5. Have students discuss information they have gathered about their plant or animal and in what habitat(s) they belong and why.
6. Have each student hold their animal or plant card and divide the class into two groups and line up each group in single file. The lines should be next to each other with the students facing the habitat boxes (relay race-style).
7. The first student in each line will, upon signal, run and place their animal/plant card in its appropriate habitat (corresponding box). The student then runs back to his/her line and tags the next person who will run and place their card in the appropriate box. This continues until each student in both groups has placed a card in the box.
8. Once the groups are finished, review the contents of each of the habitat boxes.
9. Discuss whether everyone agrees that each animal has been placed in a correct habitat. Discuss why certain organisms cannot survive in a particular habitat (wrongly placed cards). Conclude with differences of plants and animals in each habitat.
10. Tell the students they are going to repeat the game, but this time, they will not know what animal they will get and it will be a race! Spread all the cards in the middle of the students and the boxes.
11. Have the students line back up in their relay race lines. Tell the students that the first student in each line will, upon signal, run to the cards, pick one up, and place it in its appropriate habitat box. Spread all the cards on the floor between the students and the boxes.
12. Explain that they will have to think quickly after they pick up their cards to place it in a proper habitat. Note: You should stand by the boxes to make sure that the student is placing the card in a correct box. If you see them placing the card in an incorrect box, have them stop and think and place it in a correct one.
13. The student then runs back to his/her line and tags the next person who will run and select another card. This continues until everyone in one group has placed their cards in correct boxes. This team is then declared the "winner" of the Habitat Relay Race game.
14. Congratulate the students on doing a great job remembering what animals live in certain Everglades habitats.
15. Explain that some wildlife species live in only one type of habitat, while others move from one habitat to another depending on the availability of food, water, shelter and space.
16. Explain to the students that the Everglades is a very large area with many different habitats that are homes to many different animals and plants. Without these habitats, they would not be able to survive.

17. Hand out an exit slip to each student or have them write in their science journals a paragraph about why it is important for wildlife to have a home. Include two specific Everglades habitats and representative plants and animals that live there as examples to support their reasoning. Students should include words from each habitat definition to identify each habitat. For example:
    - The mangrove swamp and cypress swamp are two important habitats in the Everglades.
    - The mangrove swamp is a brackish water habitat dominated by mangrove trees and fish such as striped mullet. The cypress swamp is a fresh water habitat dominated by cypress trees and birds such as the Bald Eagle. Each habitat provides resources for these organisms to survive - water, shelter, space, food, and sunlight.

Assessment:

1. Exit slip: Have students write a paragraph about why it is important for wildlife to have a home using two specific Everglades habitats and representative plants and animals that live there as examples to support their reasoning.

Resources:

Everglades National Park (2006). Finding Home: Everglades Habitats. In *Everglades ABC's- Activity Guide for Grades K-3 Teachers* (Section 5: Second Grade Activities). Retrieved from http://www.nps.gov/ever/forteachers/k-3guide.htm

FAU/Pine Jog Environmental Education Center.

(n.d.) Hurry for a Habitat. In *Exploring the Everglades: Teacher's Guide Lesson Plans for Elementary School* (Lesson 9).

Everglades National Park (2006). Hurry for a Habitat. In The South Florida National Parks Activity Guide for 4-6 Grade Teachers (South Florida National Park Activities Section). Retrieved from http://www.nps.gov/ever/forteachers/4-6-activity-guide.htm

Everglades Food Chains

Grade Level: 4th

Objective:

Students will be able to:

- Explain what a food chain is.
- Describe a simple Everglades food chain and trace the flow of energy from the sun as it is transferred.
- Explain the impacts of a loss of a species in a food chain.

Standards:

- SC.4.L.17.3 – Trace the flow of energy from the Sun as it is transferred along the food chain through producers to consumers.
- SC.4.L.17.4 - Recognize ways plants and animals, including humans, can impact the environment.
- MAFS.K12.MP.2.1 - Reason abstractly and quantitatively.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 5

Duration: 60 minutes

At A Glance:

Students will learn about specific Everglades producers, consumers, and food chains by role-playing.

Background:

The sun acts like an engine providing the energy for nearly all living things. A **food chain** is a sequence of organisms beginning with plants (producers). Plants are foods for animals (consumers). Consumers can be divided into three groups: **herbivores** (plant eaters) such as white-tailed deer and rabbits, **carnivores** (meat eaters) such as Florida panthers, bobcats, American alligators, and hawks, and **omnivores** (plant and meat eaters), such as raccoons and opossums.

Preparation:

1. Cut animal cards from Everglades Food Chain cards.
2. Make the arm bands (Use any material that you have available, cloth, yarn, crepe paper, etc.).
3. Find a place large enough to play the game.
4. Review and load the Everglades Food Chain PowerPoint.

Procedure:

1. Assess prior knowledge by asking students what a food chain is. Show students the Everglades Food Chain PowerPoint. Discuss that plants use sunlight energy, carbon dioxide from the air, and water to make their own food and then this food energy is passed from plants to animals. Emphasize to students that most food chains begin with the sun (there are some exceptions, for example: deep sea food chains.)
2. Ask students to provide other examples of Everglades food chains. Show them the examples of food chains: sun, slash pine cone, wood rat, and Bald Eagle; sun, saw palmetto, white-tailed deer, and Florida panther; and a more complex example: sun, periphyton, mosquito larvae, mosquito fish, raccoon, bobcat, and American alligator.
3. Divide the students into three groups, giving each student an arm band.
4. 65% of the students will be herbivores, having green arm bands, 25% will be omnivores, having grey arm bands, and 10% will be carnivores, having red arm bands. For example, for a class of 20 students, you would need 13 herbivore arm bands, 5 omnivore arm bands, and 2 carnivore arm bands.
5. Explain that if they have a green arm band, they are herbivores. If they have a grey arm band, they are omnivores, and if they have a red arm band, they are carnivores.
6. Tell students that they will be creating a class bar graph to document the changes in the herbivore, omnivore, and carnivore populations over time as they act out the food chain. Draw a bar graph on the board of your total starting numbers in each group. Have the students count how many students are in each group (herbivores, omnivores, and carnivores) and create a bar for each on the bar graph. Have students copy these

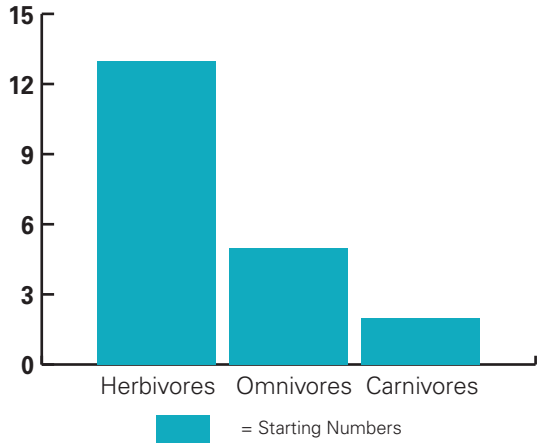
Materials:

- Poker chips (100)
- Bags (1 per student for herbivores and omnivores)
- Everglades Food Chain Cards (1 set per group)
- Everglades Food Chain PowerPoint with food chain examples:
- Food Chain Examples: Pictures of slash pine cone, wood rat, Bald Eagle food chain; saw palmetto, white-tailed deer, Florida panther food chain; periphyton, mosquito larvae, mosquito fish, raccoon, bobcat, American alligator food chain
- Large chart paper or white board
- Markers for charting (dry erase if using white board or normal if using chart paper)
- Arm Bands – Red, Green, and Gray (Use any material that you have available, cloth, yarn, crepe paper, etc.)

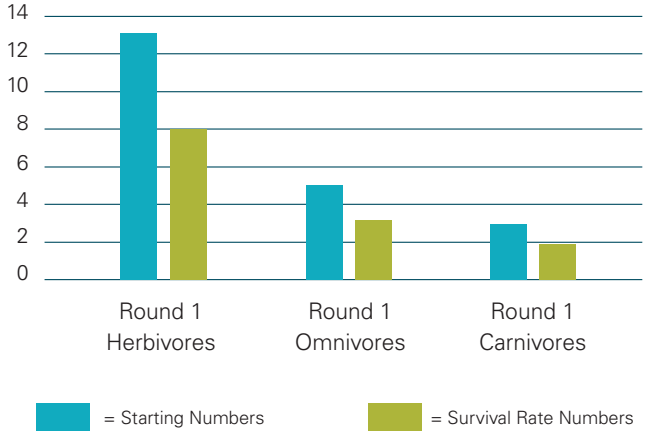
Vocabulary:

- **Carnivore** - An organism that feeds mainly on meat. In a food chain, carnivores are either secondary or tertiary consumers.
- **Food Chain** - A series of living beings in which each serves as food for the next.
- **Herbivore** - An animal that feeds only on plants. In a food chain, herbivores are primary consumers.
- **Omnivore** - An organism that eats plants and meat.

bar graphs into their science notebooks.



7. Bring students to the area where you will be playing the game.
8. Review safety rules with students before the game starts.
9. Set boundaries over a large area and randomly spread the poker chips within the playing field.
10. Show the students the poker chips and explain that they represent the plants, which are the food for the herbivores (plant eaters).
11. Hand all students a bag. Explain that this represents their stomach.
12. To start the activity, have the herbivores spread out across the playing field. Explain that when you say "GO!" they have one minute to fill their stomach (bag) as full as they can.
13. After one minute, send the omnivores (plant and meat eaters) out to the playing field to capture (tag) the plant eaters and/or collect any remaining poker chips (plants). When the omnivores tag an herbivore, they collect the herbivore's bag and empty it into their own bag. The herbivore then moves off the playing field to a designated area. Omnivores continue to hunt.
14. After two minutes, send the carnivores out on the playing field to capture (tag) any herbivores or omnivores within the playing area. Once an animal is captured, the carnivore collects their stomach bags. Captured animals move off the playing field to the pre-designated waiting area.
15. After approximately 3 minutes or less, stop the game.
16. Have all the students sit down. Find out how many of each group survived. In order for the herbivores, omnivores, and carnivores to survive, they needed to have their stomachs filled with at least 5 poker chips.
17. Document the survival rate of each group on the bar graph.



18. Play the game again. Create a new class bar graph documenting how many animals in each category are starting in round two. After the game has finished, document how many survived on the bar graph.
19. Discuss the findings displayed by the bar graphs. What patterns do they see? What happened to each group in the food chain? Did they all survive? What would happen in real life if one group disappeared from the food chain or if one group became too large? Elicit responses that point to the need to keep a balance of organisms in the food chain and the environment in which these organisms live. If herbivores disappear, there will not be enough food for omnivores and then carnivores and plant populations could grow out of control. Similarly, without omnivores or carnivores, herbivore populations, such as mice, could 'explode'.
20. Before playing the third round, ask students how they might change the game to ensure survival of each link in the food chain. Have them consider what factors they could add that would ensure a balance in the food chain. If students need help, suggest the following ideas: 1. Change the initial number in each group. 2. They could work in packs or alone just like animals. 3. They could add a 'safe zone' to represent where herbivores or omnivores would be safe from predators. Emphasize how this is like real life and how different animals use different strategies to survive.
21. Construct new bar graphs for each new round and play the game at least 2 times. After each game, record how many of which group survived and discuss which survival strategies worked best in keeping a balanced population.
22. Discuss with the students how the game they have played mimics the real world and how changes in populations of herbivores, omnivores, and carnivores can affect the food chain. Also, discuss the strategies that they can use to survive. Discuss with the students how food chains are a delicate balance and crucial for survival. If one organism in the food chain disappears, the animal that normally eats it has a harder time surviving, going all the way up to the top of the food chain.

Assessment:

1. Put students into small groups and provide each group with a set of Everglades Food Chains Cards. Point out to the students that there is information about each organism on the back of the picture. Have them make an Everglades food chain with at least three links using the cards provided.
2. Have students draw and label the food chain that they made with their cards. Have students write a summary paragraph about their Everglades food chain and explain what would happen if one of the animals in the chain disappeared. Have them explain what would be the effect on the environment if there were no more herbivores or carnivores in the Everglades using evidence from the game they played and the bar graphs to support their conclusions.

Assessment:

- Exemplar: We created an Everglades food chain that begins with the sun. Most food chains typically begin with energy from the sun. In our food chain, the sun provides energy to a pine tree that produces pinecones. A wood rat eats the seeds in the pinecone. The wood rat is an omnivore. The wood rat is then eaten by a bald eagle. The bald eagle is a carnivore. If the pine trees disappeared, due to disease or being cut down, there might not be enough food for the wood rats and their numbers would get smaller and then the remaining wood rats might all get eaten by bald eagles or other carnivores or omnivores. If all the wood rats disap peared, an important link in our food chain would be broken. We saw this happen in the game we played. In the first round of the game, all the herbivores were either eaten or did not get enough food to survive. Also, because there were no herbivores left after that round, there was not enough food for the omnivores and carnivores in the next round. Without herbivores or carnivores in the Everglades, the balance of predators and prey would not be in place and eventually all links of the food chain would suffer. Herbivores help to keep the number of plants in balance and omnivores and carnivores both depend on the herbivores for food. But omnivores and carnivores are also important because they keep the number of herbivores from getting too large. All links in the food chain are necessary and important for a healthy environment.

Resources:

Kalafarski, I., Peters, R. (2006). Food Chain Gang. In *Everglades ABC's- Activity Guide for Grades K-3 Teachers* (Section 5: Second Grade Activities). Retrieved from http://www.nps.gov/ever/forteachers/k-3guide.htm

FAU/Pine Jog Environmental Education Center.

(n.d.) Periphyton- The Base of the Food Chain. In *Exploring the Everglades: Teacher's Guide Lesson Plans for Elementary School* (Lesson 8). Retrieved from http://www.evergladesfoundation.org/what-we-do/curriculum/

Wanted - Alive!

Grade Level: 4th

Objective:

Students will be able to:

- Explain the threats to animals in certain Everglades habitats and why they are threatened or endangered.

Standards:

- SC.4.L.17.4 - Recognize ways plants and animals, including humans, can impact the environment.
- LAFS.4.W.3.7 - Conduct short research projects that build knowledge through investigation of different aspects of a topic.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 6
- Fundamental Concept 7

Duration: 60 minutes

Materials:

- Everglades by Jean Craighead George
- List of Everglades Threatened or Endangered Animal Species
- Internet access or other sources of information OR copies of data sheets
- Crayons, colored pencils, pictures from Internet
- 11" by 17" or chart paper for posters
- Poster Rubric

At A Glance:

Students will read a book titled *Everglades* by Jean Craighead George. They will research a threatened or endangered animal species and create a poster of their findings.

Background:

Threatened wildlife include species of plants and animals that are likely to become endangered in the near future, unless steps are taken to protect and manage the species and/or its habitat for its survival. A species is considered **endangered** if it is, or soon may be, in immediate danger of **extinction** unless the species or its habitat is fully protected. Each species must be listed on the Federal list of Endangered and Threatened Species before it can receive protection under the Endangered Species Act (ESA). The ESA was enacted in 1973 to conserve and set up recovery plans for listed species and their associated habitats.

In addition to the Federal list of Endangered and Threatened Species, the state of Florida maintains its own endangered species list: The State of Florida's Endangered and Threatened Species List. The Florida Fish and Wildlife Conservation Commission (FWCC) maintains the state list of animals designated as Federally-designated Endangered or Threatened, state-designated Threatened, or state-designated Species of Special Concern. All Federally listed species that occur in Florida are included on Florida's list. In addition, the state has a listing process to identify species that are not Federally listed but at risk of extinction.

The American alligator is a success story. It was first listed as endangered in 1967 in accordance with a law that preceded the ESA. However, populations quickly recovered, resulting in delisting it as an endangered species. It is still listed as threatened on the Federal list of Endangered and Threatened Species due to its similarity of appearance to the American crocodile for purposes of protection where the two species share habitat, such as the Everglades.

Preparation:

1. Some suggested websites for student research are: Florida Museum- Threatened & Endangered Species, U.S. Fish & Wildlife Service (Hint: Use searchable database by state and animal), and National Park Service (Hint: Use search box).
2. If student access to computer lab is not available, teachers can access and print the Everglades Threatened and Endangered Species Factsheets here.

Vocabulary:

- **Endangered** - Plants and animals that are, or soon may be, in immediate danger of extinction unless the species or its habitat is fully protected and managed for its survival.
- **Extinction** - When a plant or animal species no longer exists.
- **Threatened** - Plants and animals that are acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range/habitat is decreasing in area at a rapid rate and, as a consequence, is very likely to become endangered in the foreseeable future.

Procedure:

1. Read the book Everglades by Jean Craighead George to the class. Ask students to think about the different sources of information that they have investigated over the last few lessons and discuss how the Everglades has changed over time.
2. Ask them how they think the 'good story' is turning out. Explain that many animals in the Everglades are threatened or endangered. Ask students what they think the terms threatened and endangered mean. Use background information to elaborate. Explain that in some cases, animals that were once endangered, like the American alligator, have been able to recover because laws were put in place to protect them and are now considered threatened or stable. Tell students that they are going to research a current Everglades threatened or endangered species.
3. Randomly assign to each student one of the endangered or threatened species from the list of animal species provided. Hand out the "Wanted-Alive!" rubric, one for each group. Review the rubric with the students so that they have a clear understanding of the assignment expectations.
4. Explain that they will use internet sources to find information on their endangered or threatened species to make a "Wanted-Alive!" poster. Access additional teacher tips on research at the elementary level.
5. Take them to a website of your choosing, use the suggested websites, or print fact sheets to demonstrate how to search for the needed information. Suggested research sites:
   - Florida Museum- Threatened & Endangered Species
   - U.S. Fish & Wildlife Service (Hint: Use searchable database by state and animal)
   - National Park Service (Hint: Use search box)
6. Student posters should include:
   - A physical description of their species and a picture
   - Type of habitat they live in
   - Predator/prey relationship (what do they eat/what eats them)
   - Human impacts and how they threaten the species survival
   - Factors/threats contributing to species being endangered/ threatened (i.e. poaching, habitat degradation, invasive species, and increased predation)
   - What is being done or what we can do to protect them

Assessment:

1. Students should complete a poster with all required components. Have students present their posters, then display their posters around the room for an Everglades Threatened and Endangered Species Gallery. Tell students that during the gallery walk their task is to pick three species besides their own and record at least one threat for each of those species. Use the Wanted- Alive! poster rubric to score each poster.

Resources:

FAU/Pine Jog Environmental Education Center.

(n.d.) Endangered Species "Wanted - Alive!" In *Exploring the Everglades: Teacher's Guide Lesson Plans for Elementary School* (Lesson 6).

George, J. C. (1995). *Everglades.* New York, NY: HarperCollins Children's Books.

I'm In Big Trouble!

Grade Level: 4th

Objective:

Students will be able to:

- Define the terms threatened, endangered, and extinct.
- Describe how human activities and natural occurrences impact living things, including activities that harm living things and others that can benefit living things.

Standards:

- SC.4.L.17.4 - Recognize ways plants and animals, including humans, can impact the environment.
- LAFS.4.W.1.1 - Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 5
- Fundamental Concept 6
- Fundamental Concept 7

Duration: 60 minutes

At A Glance:

Students will play a game that demonstrates how animal populations can be negatively impacted by humans.

Background:

The Everglades is home to diverse plants and animals. Their habitats are being altered by humans and natural occurrences. Some human examples that are affecting animal and plant life are: habitat loss, invasive species, pollution, and human population growth. These negatively affect the ecosystem and the plants and animals that live there.

Habitat Loss: This occurs when a particular area is converted from usable to unusable habitat. Industrial activities, agriculture, aquaculture, mining, deforestation, and water extraction are all central causes of habitat loss. Habitat fragmentation, the loss of large units of habitat, is also a serious threat to the Everglades.

Invasive Species: When an animal, plant, or microbe moves into a new area, it can affect the resident species in several different ways. New species can parasitize or prey upon residents, hybridize with them, compete with them for food, bring unfamiliar diseases, modify habitats, or disrupt important interactions. Invasive species can be harmful non-native species whose introduction or spread threatens the environment, the economy and society, including human health. Invasive species can originate from other continents, adjacent countries, or from other ecosystems. Free from predation and competition that would normally limit their distribution and abundance in their natural habitats, many invasive species reproduce rapidly and damage, displace or destroy native species in our forests, agricultural areas, wetlands, lakes, and rivers.

Pollution: Pollution is emitted in many different forms, including atmospheric pollution, soil pollution, water pollution, and pesticides. There are thousands of pollutants circulating through the Earth's ecosystems, and many of these materials have significant, large-scale impacts on forests and aquatic ecosystems. Pollution can also disrupt ecological processes. For example, scientists are now linking light pollution to declines in migratory songbirds.

The discharge of toxic synthetic chemicals and heavy metals, such as mercury, into the environment causes a huge pollution problem. In aquatic ecosystems, mercury can travel up the food chain and eventually impact human health. It is important to remember that substances that are "natural" can become pollution when they are too abundant in a certain area. For example, nitrogen and phosphorous are important

Materials:

- Survival Factor cards
- I AM cards
- Masking Tape
- 6 tokens for each student
- Hat or box to pull Survival Factor cards from

Vocabulary:

- **Endangered** - Plants and animals that are, or soon may be, in immediate danger of extinction unless the species or its habitat is fully protected and managed for its survival.
- **Extinction** - When a plant or animal species no longer exists.
- **Organism** - Any living thing.
- **Threatened** - Plants and animals that are acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range/habitat is decreasing in area at a rapid rate and, as a consequence, is very likely to become endangered in the foreseeable future.

nutrients for plant growth, but when they concentrate in water systems after being applied as agricultural fertilizers, they can cause rapid and expansive growth of aquatic plants, often leading to a monoculture of plant life. In the case of the Everglades, we see this in the expansion of cattails as the dominant aquatic plant species. Also, carbon dioxide is a natural component of the atmosphere, but is considered a pollutant when emitted by human industrial activities.

Human Population: Human population growth adds to the impact of all the other causes because more people require more space and more resources. There are now over 7 billion people on Earth, more than twice as many as in 1950. While the rate of increase is slowing, it still adds more than 90 million people each year. Habitats, even healthy ones, can support just so many of anything, including people.

The population of southern Florida is about 8 million. While the impacts that each human has on the Everglades and our ecosystems in general varies widely depending on the types and amounts of resources that he or she uses, overall, increasing populations have led to increasing threats to the Everglades.

These factors are having an impact on our Everglades. It often requires a closer look at a particular place to understand the interplay between habitat loss, invasive species, human population, pollution, overharvesting, and other factors that affect the Everglades ecosystem.

Preparation:

1. Cut the I AM animal and plant cards.
2. Cut the Survival Factors Cards.
3. Have 6 tokens for each student.
4. Prepare a K-W-L chart by hand or ready on the SMART Board.
5. Have sticky notes ready.

Procedure:

/, Write the words ***extinct***, ***endangered***, and ***threatened*** on the board.

0, Ask students to turn and talk to a partner about what they know about each term. Ask each group to share what they know as you record the information in the K column of the K-W-L chart. Reference additional information about using K-W-L charts in the classroom.

1, Next, ask each group to think about extinct, endangered, and threatened animals and come up with at least one question and write in on a sticky note. Have each group share their question and put their sticky notes in the W column of the K-W-L chart.

2, Share the following definitions with them: **Threatened** refers to having a high possibility of becoming endangered. **Endangered** refers to any populations of plants or animals in danger of extinction, but there are still some left. **Extinction** is final. It means the plant or animal is gone forever. Tell students that they are going to play a game that will help illustrate how different human activities and natural occurrences can cause animal or plant species to become threatened, endangered, or extinct.

5. Distribute an I AM card with the name of an animal or plant to each student and have them tape it to their shirts. If there are more than 20 students in your class, some plants and/or animals may need to be used more than once. Tell students that the plants and animals on the cards are all native to the Everglades and most are either threatened or endangered.
6. Distribute 6 tokens to each student. Tell them that the tokens represent a population of organisms**.** Remind them that a population consists of all organisms found in a specific area; there are plant and animal populations. The size of a population is determined by the number of individuals. The populations are represented by the tokens. All the populations are the same size. Each token represents hundreds of organisms.
7. Tell the students that you are going to read some statements that will show how human activities can cause a species to become threatened or extinct. As you read, you want the students to react to what is read on each card.
8. Have everyone stand up in a circle.
9. Read each statement on the Survival Factor Sheet one at a time. After each statement, discuss with the students whether this is a human or natural activity and collectively decide which plants or animals would be affected.
10. Tell students that if the statement limits or reduces their organism's chances of survival, they must put one of their tokens on the floor in front of them.
11. Whenever you read the statement, "Human population growth increases", everyone must place a token on the floor.
12. Tell students to raise their hands when their organism has become threatened with only 3 tokens remaining or if they have only 2 tokens left, they must sit down on the floor and say, "I am in big trouble" which means they are endangered. They can continue to play until they have no more tokens which means they are extinct.
13. Continue to draw factors until everyone is sitting. During the game ask questions such as: How many of you are now threatened? (Students with 3 tokens remaining), How many organisms are now endangered? (Number of students sitting down), How many organisms have gone extinct? (Those students with no tokens left.)
14. At the conclusion of the game, ask students: Is this game life-like?Why or why not? What were some of the factors that affected the survival of your plant or animal?
15. Tell students that there is an official list of threatened and endangered species. More than 70 species in the Everglades are on the decline, including endangered species such as the Florida panther, Wood Stork, and West Indian manatee. However, there used to be many more. Due to the protection of animals like the Bald Eagle, the American alligator and the Brown Pelican, populations have recovered sufficiently for these species to be taken off the endangered list.
16. Wrap-up: Discuss with the students the following questions:
    - What are human activity and natural factors that influence the survival of populations of plants and animals in the Everglades? Can you think of some factors that this game did not consider?

- Does this game contain any facts? What are they? Are they accurate? How could you find out? Did populations have any choices? Why or why not? How could this game be changed to make it even more like real life? Did any plants or animals survive? How would you change this game to have some species survive?
- Come up with a list of human activities or natural occurrences that would increase each population's chance of surviving. For example, an oil company has come up with a new way of transporting oil that greatly reduces the chance of oil spills or rainfall this year is just right for nesting birds.

Assessment:

1. Exit Slip: Choose one endangered or threatened Everglades animal and write a paragraph which describes a human activity that would help its survival. Support your opinion with reasons and information from the game you played.
   - Exemplar: The Florida panther is endangered because of habitat loss/destruction and being vulnerable to being hit by a car. Human development has threatened its survival. The State is trying to help Florida panthers by building underground tunnels that allow Florida panthers to cross underneath and lessen the risk of being hit by a car. These efforts can help Florida panther population numbers.

Resources:

FAU/Pine Jog Environmental Education Center.

Everglades National Park (2006). And Then There Were None. In *The South Florida National Parks Activity Guide for 4-6 Grade Teachers* (Wildlife Activities Section). Retrieved from http://www.nps.gov/ever/forteachers/4-6-activity-guide.htm

Incredible Shrinking Habitat

Grade Level: 5th

Objective:

Students will be able to:

- Describe how wildlife populations and adult panther survival are affected by environmental changes associated with the impacts of development.
- Recognize that habitat loss is one of the most critical issues facing wildlife.

Standards:

- SC.5.L.15.1 - Describe how, when the environment changes, differences between individuals allow some plants and animals to survive and reproduce while others die or move to new locations.
- SC.5.N.2.1 - Recognize and explain that science is grounded in empirical observations that are testable; explanation must always be linked with evidence.
- LAFS.5.RI.1.3 - Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
- LAFS.5.SL.1.1 - Engage effectively in a range of collaborative discussions with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.

At A Glance:

Students will become Florida panthers, white-tailed deer, and motor vehicles in an active, tag-like game to simulate the disappearance of Everglades habitat and its effect on native wildlife.

Background:

The Florida panther has succumbed to numerous pressures, including loss of suitable **habitat**, and is a highly endangered species. A viable population needs large tracts of undeveloped land to sustain an adequate prey base and territory for young to disperse. Access into wilderness areas by road building for drainage canals, and increased development for ranching, lumbering, agriculture, mining, oil and gas drilling, housing and recreation all impact the Florida panther habitat and the viability of the population.

It is estimated that there are between 120 and 230 Florida panthers left in the wild. They are found in southern Florida in places such as Everglades National Park and Big Cypress National Preserve.

Florida panthers are large, tan cats. Their bodies are mainly covered in tawny-beige fur, except for the whitish-grey belly and chest. Black markings cover the tip of the tail, ears, and around the snout.

Size: Florida panthers are about 6-7 feet long – males are bigger than females.

Diet: Florida panthers are carnivores. They are skilled at hunting white-tailed deer, wild hogs, raccoons, and other medium-sized mammals and reptiles. Florida panthers also stalk birds.

Typical Lifespan: They live about 12 years in the wild, but with such a small population of Florida panthers left, they are susceptible to disease and genetic disorders.

Habitat: Florida panthers utilize the diverse environments in warm climate habitats. They live in wetlands, swamps, upland forests, and stands of saw palmetto.

Range: The historic range of the Florida panther extended from Florida to Louisiana throughout the Gulf Coast states and Arkansas. Today, the only place with wild Florida panthers is southern Florida.

Home Range: Florida panthers have huge home ranges that can span over many different habitats. The home range of male Florida panthers is about 200 square miles (or 128,494 acres) and the home range of female Florida panthers is about 75 square miles (or 48,185 acres).

- LAFS.K12.L.3.6 - Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 5
- Fundamental Concept 6
- Fundamental Concept 7

Duration: 60 minutes

Materials:

- 5 hoops or vinyl spots
- Two pieces of rope long enough to divide the playing field in half
- 4 traffic cones for boundary markers
- Poker chips for deer food (20-22 for every 10 students)
- Tape
- Incredible Shrinking Habitat Pictures
- Anticipation Guide
- Incredible Shrinking Habitat T-Chart and Answer Key

Vocabulary:

- **Habitat** - A place where an organism gets its needed items for survival.
- **Habitat loss** - When a plant or animal's habitat is destroyed, the plants, animals, and other organisms that occupied the habitat are unable to find the needed items to survive.
- **Home range** - An area that an animal uses habitually to meet its needs for survival.

Preparation:

1. Define playing area with traffic cones and place hula hoops randomly within it.
2. Load the following videos before the lesson:
   - NPS-River of Life
   - Florida Panthers
3. Print and cut out the Incredible Shrinking Habitat Pictures (white-tailed deer, Florida panther, and cars).

Procedure:

1. Ask students what they know about the Everglades. Discuss their prior knowledge of the Everglades in general.
2. Give the students the Anticipation Guide for the video clip, "Everglades: River of Life". Have students fill in the "Before Viewing" column. This anticipation guide is a set of questions that serves as a pre/post-viewing activity for the video clip. These questions can be used to assess prior knowledge of the concepts introduced in the virtual field trip, to focus learners on the information presented, and check for understanding after viewing the video clip. The Anticipation Guide can serve as a motivator for learners to stimulate their interest and to listen carefully. Use the Anticipation Guide as a focal point for discussion after viewing the video clip by having learners revisit and check their responses and explain why their choices were correct or incorrect and what they learned in the process.
3. Watch the video, River of Life.
4. After viewing the clip, have students mark the correct answers in the "After Viewing" column.
5. Ask the students what they thought of the video. As mentioned in the video, remind students that less than one-third of the historic Everglades remains today.
6. Tell the students that much of the habitat for plants and animals in the Everglades has been lost or degraded due to development and other human impacts. Tell them that one of these animals that is in great danger of becoming extinct because of **habitat loss** is the Florida panther.
7. Watch the video on Florida Panthers.
8. Hand out Incredible Shrinking Habitat T-Chart to each group of students. Discuss with the students Florida panther facts listed on the T-Chart and ask students to relate environmental factors presented in the film with the environmental threats faced by Florida panthers. After reading the first fact: Florida Panthers live in wetlands, swamps, upland forests, and stands of saw palmetto, have students fill out the Environmental Threats to Florida Panthers column. For example: Development for ranching, lumbering, agriculture, and housing leads to habitat loss for Florida Panthers. Continue the same process for the rest of the facts listed.
9. Go outside to do the activity, explaining that we will be playing a tag game to simulate a very important ecological concept.
10. Divide students-for every 10 students, you should have 6 white-tailed deer, 2 Florida panthers, and 2 in reserve to become Florida panther and white-tailed deer young. Use tape to attach pictures to players to distinguish white-tailed deer from Florida panthers.

11. Scatter poker chips that represent plants the white-tailed deer would eat randomly throughout the playing field.
12. Tell the student that:
    - Each white-tailed deer must get 4 food chips in order to survive.
    - Each Florida panther must catch (tag) at least 2 white-tailed deer, each having at least 3 food chips, in order to survive.
    - Three of the hoops/vinyl spots are "safety zones" for white-tailed deer. If 2 white-tailed deer make it to a "safety zone" together, they can increase their population (reproduce) and 2 of the reserve white-tailed deer can enter the "safety zone" with them. All must continue finding food chips to survive.
    - The remaining 2 hoops/vinyl spots are Florida panther dens. Two Florida panthers in the den site together can increase their population (reproduce), so that the two Florida panthers, each with at least 6 food chips each, in the den together can increase their population (reproduce), so that the two in reserve can join them in the den site. All must continue to tag white-tailed deer for food to survive.
    - Any white-tailed deer that are eaten (tagged) leave the game to become part of the reserves.
13. Play for a few minutes or until all the prey (deer) have been eaten or are in "safety zones".
14. Ask students about the limiting factors on the Florida panther population. Did the habitat provide enough food for the Florida panthers? For the white-tailed deer? What if there wasn't enough food for the white-tailed deer? How would that affect the Florida panther?
15. Play again, but shrink the boundaries (because of the increased development). Also, lay two ropes about a foot apart and parallel to each other (a road) down the middle of the habitat. Spread a reduced number of food chips in the habitat on both sides of the "road" to show the loss of resources from road construction.
16. Choose two students to be cars on the road. Use tape to attach a car picture to each student.
17. The cars must stay within the ropes but can tag any wildlife that try to cross the road, becoming road kill. Any tagged wildlife are road kill and must leave the game.
18. Play another round.
19. Discuss what additional factors limited the population of Florida panthers in the second game. Discuss how those could be changed. (Safe passages could be built under roads, there could be slower speed limits, we could limit human activities on lands next to the road to those that are least disturbing to Florida panthers).
20. Administer exit slip to students (see Assessment).

Assessment:

1. Exit slip: Write a paragraph discussing two reasons habitat loss is occurring in the Everglades and its impact on wildlife populations and adult panther survival.
    - Exemplar: Habitat loss is occurring in the Everglades for many reasons, including road building and housing development. When roads are built for transportation, they clear out vast amounts of land so people can easily travel. Housing development also clears a large amount of land that is typically the habitat of the Florida panthers. Florida panthers are at risk of losing their food and shelter availability, being hit by a car, and other human impacts.

Resources:

Law, L. (2006). Incredible Shrinking Habitat. In *The South Florida National Parks Activity Guide for 4-6 Grade Teachers* (Environment Activities Section). Retrieved from http://www.nps.gov/ever/forteachers/4-6-activity-guide.htm

(2001). *Everglades: River of Life.* United States: Discovery Channel. Retrieved from http://www.nps.gov/ever/photosmultimedia/riveroflife.htm

Assignment Earth: Florida Panthers. United States: Assignment Earth. Retrieved from https://www.youtube.com/watch?v=X7f_J4DniSo&t=46s

FAU/Pine Jog Environmental Education Center.

Florida Panther Net. Florida Fish and Wildlife Conservation Commission. Retrieved from http://www.floridapanthernet.org/index.php/handbook/history/home_ranges/

Invasive Species

Grade Level: 5th

Objective:

Students will be able to:

- Define exotic and invasive species and provide one example of each.
- Describe how exotic species change the environment and affect native species.
- Explain the relationship or interaction between invasive species and a native species.

Standards:

- SC.5.L.15.1 - Describe how, when the environment changes, differences between individuals allow some plants and animals to survive and reproduce while others die or move to new locations.
- LAFS.5.RI.1.3 - Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
- LAFS.5.SL.1.1 - Engage effectively in a range of collaborative discussions with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.

At A Glance:

Students will examine the effects of **exotic** and **invasive** species in an ecosystem using riddles and research. Students will be able to explain how exotic and invasive species can harm native species or habitats in the Everglades.

Background:

The natural food chain within a habitat is finely tuned. For any species to survive within a **habitat**, four components are needed: food, water, shelter, and space. Exotic and invasive exotic species can take these components away from native species.

Florida is one of the four states in the United States with the highest number of non-indigenous species (Hawaii, California, and Louisiana are the other three). Southern Florida is home to more exotic animals than any other region in the United States. Approximately 140 of the 840 plant and animal species within the boundaries of the Everglades National Park are exotic species.

Invasive species are plants or animals that are not native to a certain habitat. One of these species is called a Mayan cichlid. This fish invades the habitat of the native sunfish and competes for the same food source. Both the cichlid and the sunfish eat small fishes and aquatic invertebrates. The cichlid is also an aggressive eater, usually being the first to reach a food source and fighting off the native sunfish. This becomes a problem for the native sunfish as they are losing food sources and cannot compete with the more aggressive cichlids for food. The cichlids are faster and more aggressive and, therefore, find and consume more of the food.

The melaleuca tree (brought from Australia) may be the most harmful exotic in the area when planted. Its seeds quickly blow to wild areas and its dense growth shades out other plants and dries out the soil. Melaleuca forests can be so thick that many animals cannot even walk through or live in the area. Water requirements by melaleuca trees are four to five times more than a sawgrass marsh.

Fish such as blue tilapia, oscars, and Mayan cichlids get released into canals from home aquariums and move into the Everglades where they compete with native bass and bluegill for food and breeding space. They also prey on native species. There is no effective control method that has yet been found.

Other examples of harmful exotics and invasive exotics include Brazilian pepper, Australian pine, Cuban tree frogs, wild hogs, Burmese pythons, boa constrictors, parakeets, and parrots.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 5
- Fundamental Concept 6
- Fundamental Concept 7

Duration: 60 minutes

Materials:

- Invasive Species PowerPoint
- The Everglades Dirty Dozen Invasive List Cards
- Invasive/Exotic Species Cards and Riddles (5 sets)
- Invasive Species Curve (1 per group) - optional
- Invasive Species Research Worksheet (1 per group)

Vocabulary:

- **Exotic** - Not native plant or animal that did not grow in this area before it was brought from another area.
- **Habitat** - A place where an organism gets its needed items for survival.
- **Invasive** - Intrusive to an area; capability to take over the native plants/animals in area.
- **Native** - Being the place of birth or origin of an animal or plant.

Preparation:

1. Gather materials. Make sure you have a space big enough to do the activity.
2. Load interactive Invasive Species PowerPoint.
3. Reference The Invasion Curve: A Tool for Understanding Invasive Species Management in South Florida or print for each group of students from PowerPoint slide 4.
4. Bring up The Everglades Dirty Dozen on one or more classroom computers for students to access during the lesson.
5. Print and cut Exotic Species Cards and Riddles so that the riddle is separated from the exotic species.

Procedure:

1. Begin PowerPoint - after showing slides 1-3, ask the students:
   - What do you know about invasive species?
   - Have you ever seen an invasive species?
   - What impact do you think one type of invasive plant/animal can have on a particular habitat and the Everglades as a whole?
2. Tell the students they are going to examine the Invasive Species Curve, a tool for understanding invasive species in Florida.
3. Divide the class into 12 equal groups.
4. Hand out one of the Dirty Dozen cards to each group.
5. Hand out or show the class the Invasive Species Curve (slide 4).
6. On slide 4 of the PowerPoint, explain the Invasive Species Curve to students. The Curve shows that eradication becomes less likely and control costs increase as an invasive species spreads over time. Prevention is the most cost-effective solution, followed by eradication. If a species is not detected and removed early, intense and long-term control efforts will be unavoidable. Identify the X-axis, Time, the longer the invasive species remains in a system the more time it has to infest an area. Identify the Y-axis, Area Infested, the more infested a species is the least likely it will be to eradicate and t he more it will cost.
7. Identify the introduction point on the curve. This is where early detection is critical.
8. Review each phase of the curve, slides 5-7.
9. Now that students understand the Invasive Species Curve, hand out the Invasive Species Research Sheet to each group. Have each group fill out their Invasive Species Research Worksheet. Students should use The Everglades Dirty Dozen to research each organism.
10. Review invasive species impact on the environment and native species, slides 8-10.
11. Have students present their invasive species as you display an image of each, slides 11-22.
12. Introduce students to more exotic species by playing a riddle game.
13. Print Exotic Species Cards and Riddles.
14. Divide the class in 5 groups. Handout a set of Exotic Species Cards and riddles to each group.
15. Have each group match the cards with the riddles. Share the correct answers with the class and have them make any corrections. Collect each set. Keep one set to distribute.
16. Split the class in half (half the class will have an exotic species and other half will have the riddles).

17. Tape an exotic species to the back of each person (half of the class). They should not see or know what species they are.
18. Next, hand out the riddles that match each of the exotic species you used to the other half of the class.
19. Instruct the students with the riddles that they are going to read the riddle to themselves and then go find the organism that matches with the riddle.
20. Once they find their match, they will read the riddle to the other student. The other student will guess what exotic species they are.
21. Once they guess correctly, have them stand together and wait until all the students have found their match.
22. Stand in a circle and have each pair read the riddle. Let the group guess which exotic species it is.

Assessment:

1. Have students answer these guided questions.
    - What is an invasive species?
    - How do invasive species get here?
    - Would an invasive species be a good pet? Why or why not?
    - How can we prevent the spread of invasive species?
    - At which point on the invasive species curve is eradication possible?

Resources:

FAU/Pine Jog Environmental Education Center.

Everglades National Park. Go Back Home. In *Don't Let it Loose! Activity Guide for Teachers* (Section 2: Activities). Retrieved from http://www.nps.gov/ever/forteachers/dlil.htm

Fishy Business

Grade Level: 5th

Objective:

Students will be able to:

- Describe a basic food chain.
- Define and give examples of exotic species.
- Discuss how exotic species can disrupt a food chain.

Standards:

- SC.5.L.17.1 - Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycles variations, animal behaviors, and physical characteristics.
- SC.5.N.1.1 - Define a problem, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types such as: systematic observations, experiments requiring the identification of variables, collecting and organizing data, interpreting data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.
- LAFS.5.L.3.6 - Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships.

At A Glance:

Students will examine the effect of **exotic** species on an ecosystem by role-playing both a healthy food chain, and a food chain that has been impacted by Mayan cichlids. In the process of role-playing, students will compare and contrast the adaptations of a **native** species and an exotic species.

Background:

People play a significant role in the movement of species around the world. While this distribution is sometimes accidental, certain industries (such as agriculture, horticulture, and research) depend on the delivery of new plants to areas around the globe. While the vast majority of these **exotic** species remain in isolated and controlled cultivation, the few that escape can become **invasive** and have serious consequences on an ecosystem.

Of particular concern to the Everglades are a number of exotic plant species that **threaten** to overtake and displace **native** vegetation on a large scale. Melaleuca, Brazilian pepper, and Old World climbing fern are a few of the exotic species that can produce vast monocultures (communities comprised of only one species) over the landscape. These plants can successfully utilize limited resources to dominate natural communities. These invasions often result in a non-diverse monoculture that proves inhospitable to all but the heartiest of wildlife. The loss of the viable, healthy habitats continues to be problematic for several **endangered** species that depend on them, and may ultimately threaten them with **extinction**!

Not only are there exotic plants, but there are exotic animals! One exotic fish species is called a Mayan cichlid, invading the habitat of the native bluegill and **compete** for the same food source. Although both fish share some similar **adaptations**, the Mayan cichlid has some unique adaptations that allow it to outcompete the bluegill for food. Both the Mayan cichlid and the bluegill eat small fishes and aquatic invertebrates. The Mayan cichlid is an aggressive eater, usually being the first to reach a food source and fighting off the native bluegill. This becomes a problem for the native bluegills as they are losing food sources and cannot compete with more aggressive Mayan cichlids for food. The Mayan cichlids are faster and more aggressive and therefore find and consume more of the food.

Preparation:

1. Gather materials.
2. Load the Great Egret, Bluegill, and Wild Mayan Cichlids videos.
3. Find space to facilitate activity.
4. Note: Establish ground rules for student behavior. Behave in ways that are not harmful to other students: no tackling, shoving or hitting. Also, have the students walk as they go through the activity, this way they will not collide.

- LAFS.5.W.3.8 - Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.

Everglades Literacy Conceptual Framework Connections:

- Fundamental Concept 1
- Fundamental Concept 5
- Fundamental Concept 6
- Fundamental Concept 7

Duration: 60 minutes

Materials:

- Bluegill signs on string
- Great Egret signs on string
- Mayan cichlids signs on string
- Hoops or vinyl spots (4)
- Pipe cleaners (75)
- Index cards (8)
- Whistle
- Large piece of paper or movable white board
- Writing utensil for large piece of paper or dry erase markers for white board
- Student Graphing Worksheet

Vocabulary:

- **Adaptation -** Any structure or behavior of a species which helps it to become better fitted to survive and reproduce in its environment.
- **Compete** - A contest between organisms for resources and/or goods/space etc.
- **Exotic** - Not native plant or animal that did not grow in this area before it was brought from another area.
- **Invasive** - Intrusive to an area; has the capability to take over the native plants/animals in an area.
- **Native** - Being the place of birth or origin of an animal or plant.
- **Organism** - Any living thing.

Procedure:

1. Tell students they are going to further explore the effects of exotic species on an ecosystem by role playing both a healthy food chain and one that has been impacted by an exotic species. They will also observe the adaptations of two species that must compete for the same food source. Use these videos to acquaint students with the adaptations of the Great Egrets, Bluegill, and Wild Mayan Cichlids. Ask students to pay special attention to the adaptations, both structural and behavioral, of these three organisms. For example, the long legs and long beak of Great Egrets. Note: You will only need to watch a minute or less of each video to introduce the students to each of these animals.
2. Ask students to recall what defines an invasive species and a native species as discussed in Lesson 2. Divide the class into 8 small groups. Give each group one vocabulary word. On an index card, have each group define the word and draw a picture of what that word means to them. Have each group share with the class.
3. Select students to be either (predators) Great Egrets or (prey) bluegills– approximately one Great Egret for every four to six bluegills. You will not yet choose students to be the Mayan cichlids; the first few rounds are to see how a normal food chain would work. Use the pictures on string to hang around the students' neck to help identify predators from prey.
4. Using a gymnasium or field, identify one end of the area as the "food source" and the other end as the "shelter."
5. Place the four hoops/vinyl spots in the open area between the "shelter" and the "food." These will represent shelter or cover for the bluegill and can be randomly distributed on the field.
6. Pipe cleaners will serve as "food sources." Be sure to have at least three food tokens (pipe cleaners) for each bluegill.
7. Use the whistle to start each round. When a round begins, bluegills start from their shelter. The task of the bluegill is to move from the primary shelter to the food source, collecting one food token each trip and returning to the primary shelter.
8. Tell the students that their travel is hazardous. They need to be alert to possible predators like Great Egrets. If they spot a Great Egret, they can hide under cover (in a hoop/vinyl spot) for 5 seconds.
9. The Great Egrets start the activity anywhere in the open area between the ends of the field and thus are randomly distributed between the bluegill food and the primary shelter. Great Egrets attempt to capture bluegills for food, tagging only the bluegills that are not under cover. When a bluegill is eaten (tagged), they must go sit on the sidelines for the duration of the first round. During each round, a Great Egret can only eat (tag) 2 bluegills, this is their food limit (reminder: bluegills have a food limit of 3).
10. When each remaining bluegill has accumulated 3 pipe cleaners at the primary shelter, the round is over. Using a large piece of paper or a movable dry erase board, have the students record how many bluegills survived. Putting this into a bar graph form is recommended. Continue to record and graph each round.
11. Play another round using just the bluegills and the Great Egrets and record that data as well. See how many bluegills are able to survive each round.
12. After a few rounds of the natural food chain, introduce the Mayan cichlids. Choose about ¼ of the students (that were bluegills) to represent the Mayan cichlids.
13. The feeding habits of the bluegills and Great Egrets will continue as before. In this round, the way the bluegills move will be different. Since the Mayan cichlids' adaptations make them faster and more aggressive, they are able to move normally. The bluegills must now hop on one leg because their adaptations make them slower swimmers. So they don't get tired, the students can switch legs after they've hopped on the same one 5 times.

14. Also, because the Mayan cichlids are more aggressive eaters, they can take up to 2 food tokens on each trip to the food source (requiring only 2 trips between shelter and food source, where bluegills still need to make 3 trips).
15. Record the number of bluegills that survived versus the number of Mayan cichlids.
16. Play another round, this time increasing the number of Mayan cichlids. Any student who was "eaten" during the previous round is now a Mayan cichlid. This continues for as many rounds as long as there are bluegills.
17. Remember to record the number of Mayan cichlids versus the number of bluegills at the end of each round with the bar graph.
18. Wrap up - Ask students: What might be the eventual result if we continued this activity? Is this result favorable? Why or why not?
19. Hand out the Graphing Worksheet to have the students create a bar graph documenting the results of the experiment. Note: students will have to create units of measurement on the vertical axis.
20. Once the students have recognized the negative effects of the Mayan cichlids, discuss how they might propose solving this difficult problem and prevent such a thing from happening.
21. See Assessment. Have students use at least three vocabulary words (see Vocabulary list). Example: In a natural food chain, native Great Egrets eat native bluegill. When exotic species are introduced, the food chain changes. Bluegills must compete with Mayan cichlids that swim faster and are more aggressive. If the Mayan cichlids are not being caught as much as the bluegills are, that changes the availability of each organism which can then impact the natural food chain.

Assessment:

1. Have students draw a diagram of what happened in the activity, referring to the data. They can write and draw to depict the relationship of the bluegills, Great Egrets, and Mayan cichlids.
2. Write a paragraph comparing and contrasting the adaptations of the bluegill and the Mayan cichlid and what effect this has on their ability to survive. Students can compare size, color, adaptability to salinity, breeding habits, and diet.
   Exemplar: Both bluegill and Mayan cichlids are adapted to eat the same diet of small fishes and invertebrates. However, the bluegill is a slow swimmer but the Mayan cichlid is adapted to be faster. The Mayan cichlid is also adapted to be a more aggressive fish.

Resources:

FAU/Pine Jog Environmental Education Center.

Everglades National Park. Fishy Business. In *Don't Let it Loose! Activity Guide for Teachers* (Section 2: Activities). Retrieved from http://www.nps.gov/ever/forteachers/dlil.htm