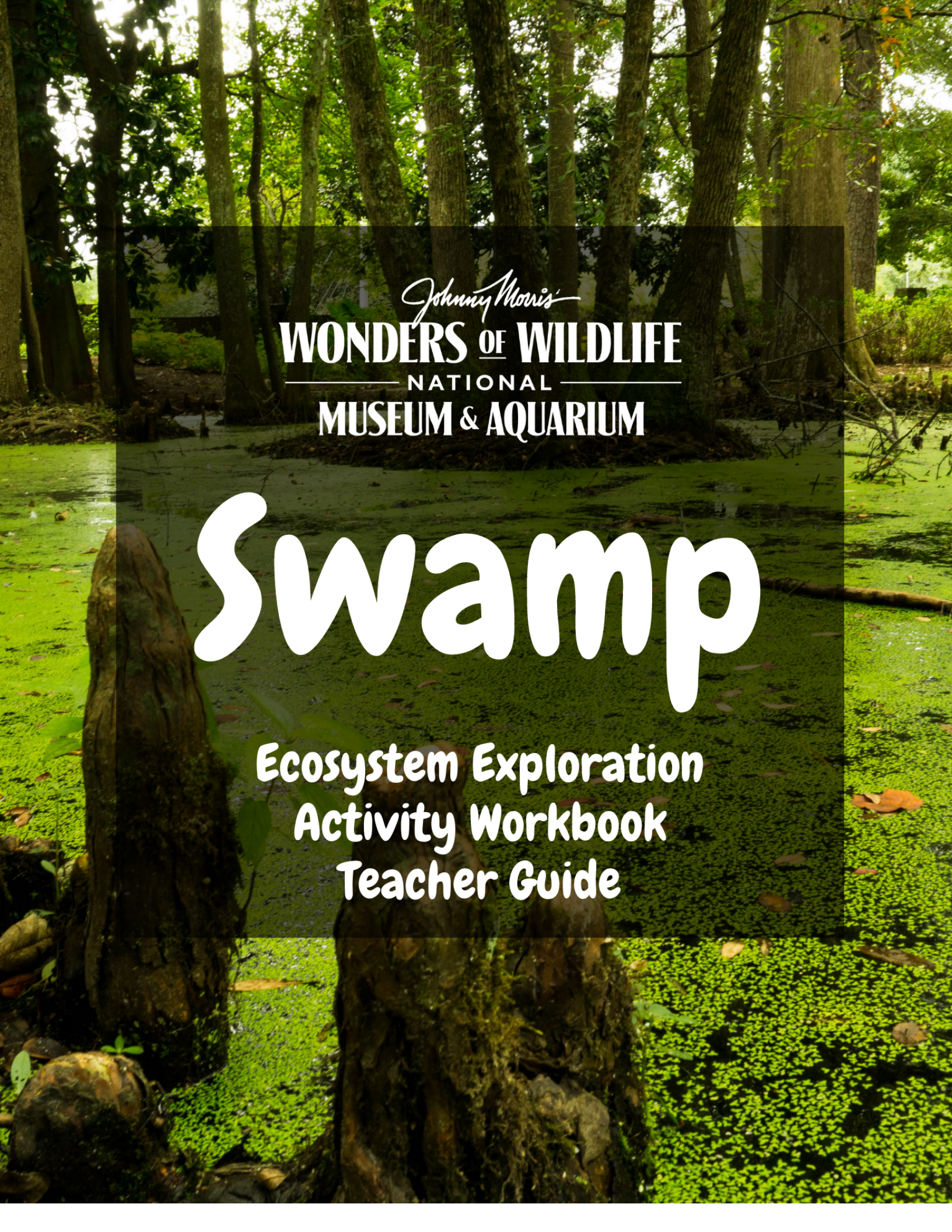

Johnny Morris's
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Swamp

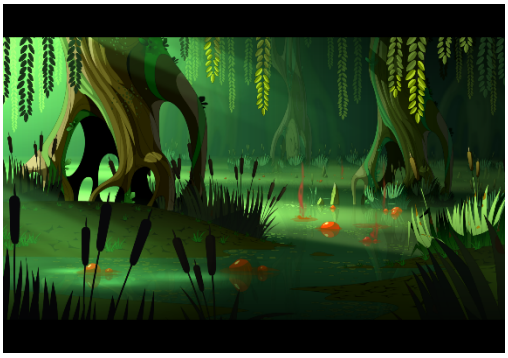
Ecosystem Exploration Activity Workbook Teacher Guide

North American Swamps

Subject Area: Science – Geography, Ecosystems, Lifecycles

Grades: K-5

Time: This lesson can be completed in 1 day (6 hours)



Essential Questions:

- What are swamps?
- Are swamps, marshes, and bogs the same?
- Who lives there?
- How does a trees life-cycle work?

Purpose and Overview:

The purpose of this lesson is to introduce students to North American swamp ecosystems and habitats as well as various organisms that call them home. At the end of the lesson students will have a better understanding of how swamp ecosystems play a vital role in our world as well as a have a deeper appreciation for what calls them home.

Introduction:

Welcome to North American swamps! The following pages contain lessons that you can group together, as well as utilize individually for your students. There will be vocab listed throughout with a vocab list given just after the "Standards" page. With it, you may choose to test your students with a vocab quiz at any time. All lessons come with a craft portion, so make sure to check out the listed materials section and plan a head accordingly if you wish for your students to participate in the crafts. Print-outs for specific crafts will be available in PDF format

There are also imbedded video links for various sections as well as an additional resource section with more handy links available. It is always a good idea to have these loaded a head of time as well, especially if you experience long load times on slower internet connections. The first video is an Eco-Exploration video showcasing our swamp exhibit here at Wonders of Wildlife. Located under the "Classroom Discussion & Activities" section. If you can, please view this video before getting into your lessons as it will help set the picture for students as well as give some helpful insight to lessons.

Objectives:

- To be able to identify key characteristics of swamp ecosystems.
- Compare similarities and differences between swamp and marsh regions.
- Understand the diversity of organisms that live within these habitats.
- Examine the impacts these regions are facing today and the effects it could have over time.

Standards:

Next Generation Science Standards

Disciplinary Core Ideas

- LS1.A: Structure and Function
- LS1.B: Growth and Development of Organisms
- LS2.A: Interdependent Relationships in Ecosystems
- LS2.B: Cycles of Matter and Energy Transfer in Ecosystems
- LS2.C: Ecosystem Dynamics, Functioning, and Resilience
- LS4.B: Natural Selection
- LS4.C: Adaptation
- LS4.D: Biodiversity and Humans
- ESS2.D: Weather and Climate
- ESS3.C: Human Impact on Earth Systems

Crosscutting Concepts

- Patterns
- Cause and Effect
- Systems and System Models
- Stability and Change

Science and Engineering Practices

- Evaluating and Communicating Information
- Constructing Explanations

Vocabulary

Adaptation: A characteristic or trait that allows an organism to be better suited for survival and reproduction within a given habitat.

Aquatic Animals: Animals that live predominantly or entirely in the water.

Biodiversity: When many different types of animal and plant species live in a particular ecosystem or habitat.

Biodiversity Hotspot: An ecosystem or region with a significantly high amount of biodiversity that is also currently under threat of being destroyed.

Conservation: Prudent use without waste; especially in the interest of wildlife, natural resources, and land management.

Ecosystem: A community of living organisms in conjunction with the nonliving components of their environment, interacting as a system.

Endangered Species: A species of animal or plant that is in danger of going extinct.

Erosion: The process of wind, water, or other natural forces breaking down something over a period of time.

Habitat: The natural home of a living thing.

Organism: An individual living thing.

Pollution: When a harmful substance is out in the wrong place and/or in the wrong quantity and has a harmful effect on the environment.

Survive: To continue to live or exist, especially in spite of danger or hardship.

Swamp: An area of low-lying, uncultivated ground where water collects. Often considered to be transition zones of both land and water.

Terrestrial Animals: Animals that live predominantly or entirely on land.

Wetland: land consisting of marshes or swamps; saturated land.

Materials:

Teacher:

- Computer, Project Printouts, Screen, Internet

Videos:

- Videos are located throughout the document. Load them prior for quick access.

Printouts:

*****Attached throughout and at the end of the lesson plan*

Students:

- Writing Utensil
- Note Paper
- Printouts (best for your grade level)

Classroom Discussion & Activities:

I. To begin, start off by asking your students some engaging questions. They can either be in a group discussion or asked and then have students write the answers down for later reference to see what they have learned after the lesson. Here are some questions you can ask…

   a. What do you think a swamp is?
   b. Where in North America do you think most swamps are found?
   c. Are there different types of swamps?
   d. How do you think organisms survive in a swamp ecosystem?
   e. Are swamps beneficial to us, if so how?

II. With those questions answered and the discussion started, prepare video(s) and printouts for presentation to class.

   a. Hand out desired printouts
   b. https://www.youtube.com/watch?v=xBBJl7Y44gs&t=2s
   c. Tailor and structure for your class
   d. Do further investigation to expand on pre-questions and classroom discussions.

What is a Swamp?

1. In this first section you will lay the foundation for the rest of the lesson packet. Provide visuals via maps, globes, and charts for students to know where some places swamps are found within North America. The list below will provide students with the basic characteristics of a swamp ecosystem. The end will conclude with a craft project.
   a. **Swamps** are areas of low-lying, uncultivated ground where water collects. They are often considered to be transition zones because they span both land and water. A lot of times swamps are considered damp, dark, and scary places. Sure, they might not be much to the eye at first as far as cleanliness goes, but they are rich ecosystems full of biodiversity between aquatic and terrestrial organisms, as well as ecologically important for many surrounding areas.

      i. Provide students with the definition of **ecosystem**. A community of living organisms in conjunction with the nonliving components of their environment, interacting as a system.
      ii. Provide students with the definition of **biodiversity**. When many different types of animal and plant species live in a particular ecosystem or habitat.
      iii. Provide students with the definition of **aquatic animals**. Animals that live predominantly or entirely in the water.
      iv. Provide students with the definition of **terrestrial animals**. Animals that live predominantly or entirely on land.

b. Swamps are a type of wetland that links land and water and have many different habitats within them.
   - **i.** Provide students with the definition on a **wetland**. A wetland land consisting of marshes or swamps; saturated land.
   - **ii.** Provide students with the definition of **habitat**. The natural home of a living thing.

c. Swamps can occur in areas with either fresh or salt water. This will determine the types of organisms (plants & animals) found within its ecosystem.

d. They are predominately forested and often classified as one of three main types which are dependent on the types of trees that are present.
   - **i.** Hardwood swamps
   - **ii.** Cedar swamps
   - **iii.** Cypress swamps

e. They are similar to lowland forests because they are in low-lying areas, however swamps will typically have deeper standing water and are wet for longer periods of the year.

f. Feel Free to add any additional instruction before moving on to the Ecosystem Mobile craft at the end of this guide.

g. Below is a link to our Book and a Beast, *The Swamp Where Gator Hides.* This reading will introduce students to some different organisms that call North American swamps home as well as additional ecosystem facts. Stick around at the end to meet Alex, our great plains rat snake ambassador here at Wonders of Wildlife.
https://www.youtube.com/watch?v=ZSTdDeyBKng&t=421s

Are Swamps and Marshes the Same?

2. Now that students know what swamps are and some of their characteristics, you will lead them in a discussion over the difference between similar ecosystems.
   - **i.** Provide students with the definition of **biodiversity hotspot**. An ecosystem or region with a significantly high amount of biodiversity that is also currently under threat of being destroyed.
   - **ii.** Provide students with the definition of **erosion**. The process of wind, water, or other natural forces breaking down something over a period of time.
   - **iii.** Provide students with the definition of **pollution**. When a harmful substance is out in the wrong place and/or in the wrong quantity and has a harmful effect on the environment.
   - **iv.** After working through this section, your students should be able to complete the Venn Diagram comparing the three ecosystems.

○ Swamps

- Type of wetland
- Can have fresh or salt water
- Predominately forested
- Three main types; hardwood, cedar, and cypress swamps
- Found on every continent except Antarctica
- Biodiversity hotspot for animals and aquatic plants
- Coastal Mangrove forests are also considered swamps
- They help purify polluted water
- Assist in softening the destructive power of floods and storms.
- They are large carbon sinks

○ Marshes

- Type of wetland
- Can have fresh or salt water
- Very few if any trees
- Predominately grasses, reeds, and herbaceous plants
- Rich muddy waterlogged soils
- Three types; freshwater, tidal freshwater, and tidal saltwater marshes
- Biodiversity hotspot for animals and aquatic plants
- They help purify polluted water
- Assist in softening the destructive power of floods and storms
- They are large carbon sinks

○ Bogs

- Type of wetland
- Is comprised of fresh water
- Highly acidic and low oxygenated waters
- Organic matter accumulates faster than it can decay
- Typically found within cool northern climates
- Soft, spongy ground covered with partially decayed plant matter
- Variety of bog types; blanket, cataract, quaking, raised, and string bogs
- Typically formed when a lake becomes filled with plant debris (slowly over time)
- They prevent flooding, absorb runoff and are large carbon sinks
- Bogs produce peat which is a fossil fuel and the first stage of plant material turning into coal

Mistaken Identities

3. With this section students will learn more about what makes organisms unique from one another, adaptations. The two organisms this portion will focus on are alligators and crocodiles! Today there are over a million estimated living alligators in North America in the south western United States, while there are only an estimated couple thousand crocodiles living in the southern tip of Florida. Most American crocodiles live in Central America, Northern South America, and the countries of the Caribbean Sea. It may be difficult to imagine, but the American alligator was once endangered from over harvesting. Thanks to conservation efforts and regulations, the American alligator populations continue to grow steadily even with a regulated hunting season. The American crocodile is considered vulnerable, but they are also seeing increases in population trends, hopefully to continue moving them to a least concerned status.

    - Provide students with the definition of **organism**. An individual living thing.
    - Provide students with the definition of **adaptation**. A characteristic or trait that allows an organism to be better suited for survival and reproduction within a given habitat.
    - Provide students with the definition of **survive**. To continue to live or exist, especially in spite of danger or hardship.
    - Provide students with the definition of **endangered species**. A species of animal or plant that is in danger of going extinct.
    - Provide students with the definition of **conservation**. Prudent use without waste; especially in the interest of wildlife, natural resources, and land management.

    a. **Engage**
        i. Show students the two photos, the American alligator and the other of the American crocodile.
            1. Fun fact: Florida is the only place in the world where you can find alligators and crocodiles living together in the wild!
        ii. Start by asking students questions. What do we already know about them? What similarities do they share?
            1. They are both reptiles and are cold blooded. What does it mean to be cold blooded? They cannot self-regulate their internal body temperature and are reliant on external forces such as solar radiation from the sun, to help keep their metabolism healthy.
            2. They are both carnivores. What is a carnivore? As organism who's diet primarily consists of or is exclusively meat.
            3. They are related to each other. They belong to the Order Crocodilia. What is and "Order"? An Order is a level of classification within the taxonomic tree that helps define all living things and helps us understand what organisms are related to one another and how closely.
                a. After "Order" comes "Family". There are only 2 species of alligators while there are 14 species of "true" crocodiles.

4. Alligators and crocodiles have the strongest bite forces recorded of any land animal in the world. The crocodile has a stronger bite force than the American alligator.

iii. Now ask students what differences they have. These will be the facts students will use to tell them apart for the activities below.
   1. Do they have the same teeth? Yes and no. Their teeth are both designed to do the same thing, which is tear, rip, and shred their food apart. But their jaws are not designed the same. An alligator's upper jaw is larger than its lower jaw so when they have their mouth shut, you can see only the upper teeth pointing down. A crocodile's upper and lower jaw are the same size, so when their mouth is shut you can see teeth pointing upwards and down.
   2. Is their head shape the same? No. Alligators have a broader head with a U-shaped snout whereas crocodiles have a V-shaped snout. Could this difference determine what prey they are able to catch?
   3. Are they the same color? No. When alligators are young they will have a dark color along their back with reoccurring lighter lines, as they get older, most will become almost entirely black on their backside with light underbellies and sometimes with an olive hue due to habitat conditions. Crocodiles will maintain a tan/brown with possibly a tad of olive appearance their whole life.
      a. Why might alligators have dark upper bodies and lighter undersides? How does countershading camouflage help them in the wild? Is this an adaptation?
   4. Do they like the same type of water? Yes and no. Alligators will only be found in freshwater ecosystems whereas crocodiles can be found in freshwater as well as brackish/salty ecosystems like mangrove swamps.
      a. Crocodiles have a specialized tongue that can secrete excess salt taken from the water. Alligators can do this as well be not as effectively, so they prefer non-salty water.
   5. Are they the same size? No. Crocodiles are generally bigger than alligators.
      a. There are some crocodile species that are smaller than the American alligator, however the larger crocodile species can get up to 5 feet longer and up to two times the weight of an alligator.

Cause & Effect

4. Lead students on a discussion about cause and effect relations within ecosystems. There are often several different habitats found throughout a single ecosystem. With this lesson students will be looking at a fallen log and how things change over time. After the discussion use the proceeding worksheet to test your students understanding of cause and effect relations.

a. 4 stages of decomposing tree

1. Stress/trauma

    a. This is an event that causes the death of the tree. This is the first step in the decomposition process. While the tree is still standing it serves as a unique habitat for many organisms. Can you name a few you might find?

2. Falling

    a. This is the act of the tree falling to the ground. Once the tree falls to the ground, the decomposition starts to set in. Even though the decomposition is accelerated when the tree reaches the ground, this process still is lengthy because woody plants are harder to break down. The species of the tree determines the rate of decomposition.
    b. This newly fallen tree has now undergone a drastic change and can offer a whole new habitat for various organisms. What are some different organisms you might find in a fallen tree vs an upright tree?
    c. Once a tree falls it opens more area for the sun to shine through and more space for other codominant species to flourish. This can produce habitat change both as an opportunity for some species while a struggle for others.

3. Fungi/Mushroom growth

    a. Although this stage is numbered after the falling stage, this process *can* happen while the tree is upright. If you were to see mushrooms or fungi growing on a living tree, that can be an indication that that organism might have internal issues taking place.
    b. This stage can provide huge opportunities for other organisms to find food. Detritivores now have a new food access!

4. Nutrient Recycling

    a. Just because a tree has fallen/died doesn't mean that it stops working. The tree's fibers (cellulose & lignin) are broken down even further and converted to carbon dioxide and water! There are many nutrients left even after this process. Everything left over is decomposed into the soil and left over for future generations of organisms to use and thrive on!

b. Hand out "Cause & Effects" lesson sheets.

i. In the "Cause" box have the students list a type of stress or trauma a tree could experience in a swamp ecosystem that would cause it to die.

ii. In the "Effect" boxes have students right down things that change from when the tree was once alive vs now that it's started decomposing. Good starting questions are do the organisms found within or around the tree change, what about the tree itself?

iii. At the bottom there are lines for a comprehensive short answer if you wish to follow up with another challenge.

What You Can Do

5. Engage with your students and ask them what are some sustainable practices that they can do to help their environment and to explain how they would go about it.
    a. Here are some practices to help get them going if they are having a difficult time thinking of something.

        v. Educate
        vi. Volunteering
        vii. Alternative energy
        viii. Reduce, reuse, recycle
        ix. Reduce landfill waste
        x. Sustainable fishing & agriculture
        xi. Protect wildlife
        xii. Conserve water
        xiii. Regulations
        xiv. Sustainable hunting
        xv. Manufacturing practices
        xvi. Speaking up, raise your voice

Evaluation

6. Evaluate your students and see what they have learned.

    a. If you had the students write down the first questions and answer them, have them go back and answer the questions again to see if their answers have changed or stayed the same.

Additional Resources

Partners:

- Ducks Unlimited
    - https://www.ducks.org/

- The Everglades Foundation
    - **https://www.evergladesfoundation.org/**

Additional Activities

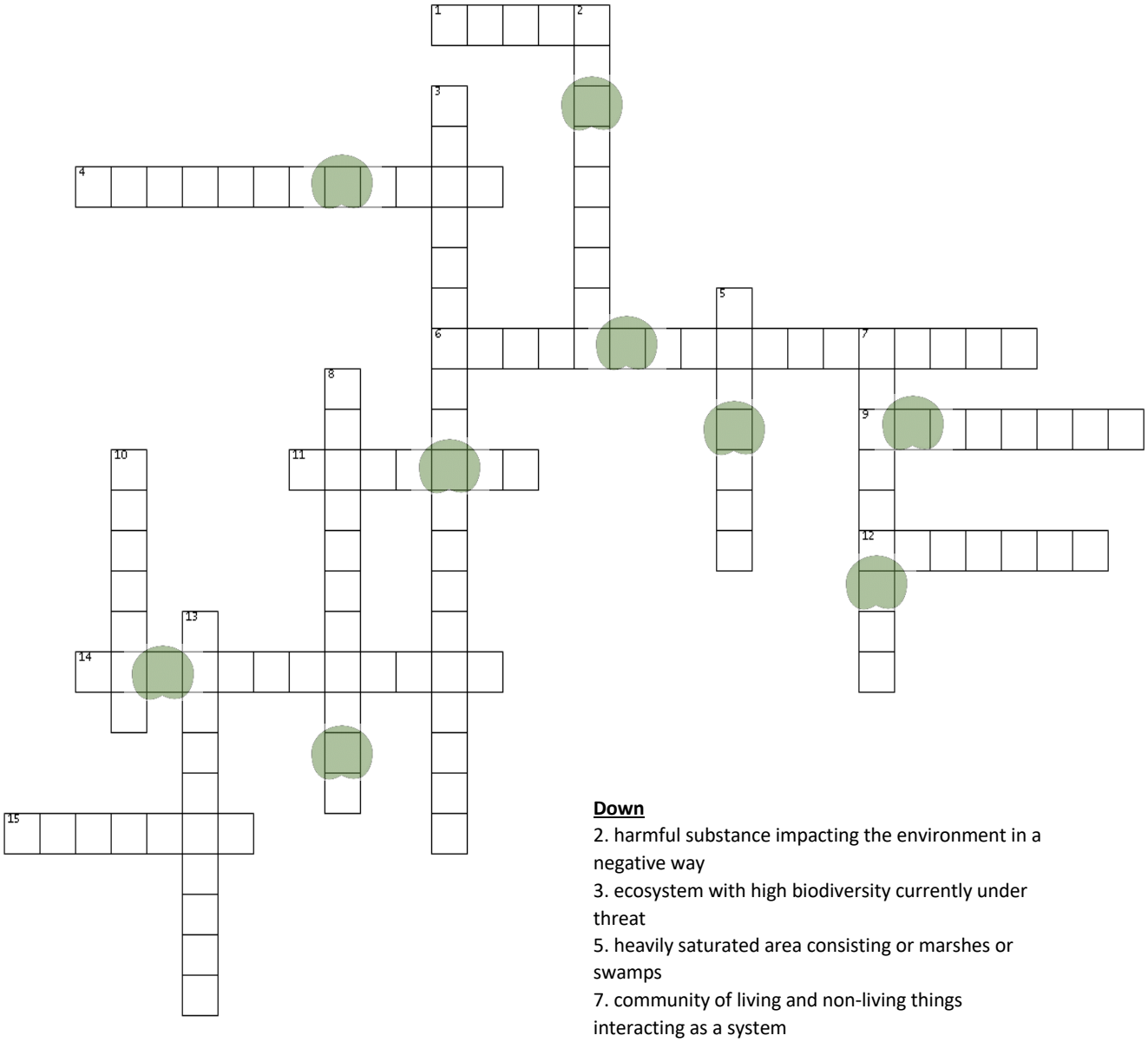
Puzzles:

- Hidden Message Among The Lily Pads
    - When completing this crossword puzzle students will notice that some letters are floating upon lily pads. If students take these letters they will form a jumble puzzle that they must rearrange to form the hidden message.
    - Clue: In the swamp is where I hide, under water I'll often reside. Often seen as a place of dread, I rely on it to keep me fed. My scutes are tough and strong, within this place I truly belong. What am I? (Alligator)

- Swamp Search
    - This one is to help students with vocabulary

Student Name:

Hidden Message Among The Lily Pads



Across

1. often considered as transitional zones between land and water
4. prudent use without waste
6. a species in danger of going extinct
9. an individual living thing
11. process where natural forces break something down over time
12. continuing to live in spite of danger or hardship
14. many different organisms living together in a particular ecosystem
15. the natural home of a living thing

Down

2. harmful substance impacting the environment in a negative way
3. ecosystem with high biodiversity currently under threat
5. heavily saturated area consisting or marshes or swamps
7. community of living and non-living things interacting as a system
8. lives predominately or entirely on land
10. lives predominately or entirely in water
13. traits that allow organism to be better suited for survival

Swamp Search

Student Name:_____

B V A Z R N M N C V Q P T X C E Q W S M
F S P M Y X O O V J L S A I J W U S S L
C P O L L U T I O N G W T F I E T I I J
D O D D Q F A T S K L A I A G E N G W E
P N N Q R M J A E O U M B H C A L Y C C
X S A S F H C T I Q R P A A G R R U J O
V R X L E B U P A T W E H R O Y D N J S
U Y L X T R T A G M X X O I F C G J O Y
G R S N J E V D L A I R T S E R R E T S
Q T S U K W W A G Z D G R R L L D O U T
N L M Q R E K Q T T J Y J F Q Z F G T E
B I O D I V E R S I T Y H O T S P O T M
H U W K L A I S T O O T D T Y V R T S I
C M C M Y Q H V V Q C N T N G Q K E T X
S E I C E P S D E R E G N A D N E M R B

-Adaptation -Aquatic Animals -Biodiversity -Conservation

-Ecosystem -Endangered Species -Erosion -Habitat -Organism -Pollution -Survive

-Swamp -Terrestrial Animals -Wetland

Kindergarten and First Grade Activities

Band Aid Firefly Craft

Materials

- Black sheet of construction paper
- Yellow and White crayon
- Colorful band-aids
- Plain band-aids
- Glue
- Wiggly eyes
- Yellow puffy paint

Directions

- Draw a moon and stars on your black sheet of construction paper
- Place the plain band aids on the paper to serve as the body of your fireflies
- Take two colored bandaids of the same color and place the over the body, forming an "X" to make the wings
- Glue the wiggly eyes onto the top of your fireflies. You can use a marker to add more details to the faces if you'd like
- Use the yellow crayon to draw antennae on the fireflies
- Use the yellow puff paint on the bottom of the fireflies to create a 3D effect glow.

Swamp Slime Sensory Bin

Materials

- Small Tray or Bin
- Small Bowl
- Corn Flour
- Water
- Green Food Coloring
- Spoon
- River Rocks
- Celery Stalk
- Celery Tops
- Peas
- Swamp Creature Toys

Directions

- To make the Oobleck, or your murky water, mix corn flour and water until you reach the desired consistency. Start with 1 cup of each ingredient and adjust from there.
- Add food coloring to the mixture to achieve desired shade.
- Pour the mixture into a tray and let it settle evenly on the bottom of the tray.
- Once the mixture has settled, start adding rocks and other decorative items to the edge of the tray, leaving the middle of the tray open for play.
- Add your animals and peas in the middle area, and let your students interact. Have them discuss what roles each animal plays in the food chain and larger ecosystem.

~Edible~ Swamp Cup

- Materials
  - Zip lock bags- sandwich size
  - Oreos
  - Gummy worms/frogs
  - Chocolate pudding mix
  - Vanilla pudding mix
  - Milk
  - Whipped topping
  - Blue food coloring
  - Clear plastic cups
  - Whisk
  - Spoon
  - Multicolored sprinkles
  - Pretzel sticks

- Preparation- This needs to be done *at least* one hour prior to the lesson but can be sooner if needed.

  - You are going to need to make both a chocolate pudding and vanilla pudding for this activity. You will be adding blue food coloring to the vanilla pudding to represent the water of the marsh.

  - You can always double or triple the amount depending on the size of the group.

    1. In a medium bowl whisk together chocolate pudding mix and 2 cups milk in a medium bowl for 2 minutes. Let stand 5 minutes.
    2. Fold in whipped topping into chocolate pudding.
    3. Whisk together vanilla pudding mix and milk in a medium bowl for 2 minutes.
    4. Add blue food coloring next. You can add any desired amount of the color for any shade of blue.
    5. After the vanilla pudding is colored, fold in whipped topping into the blue pudding. Let stand for 5 minutes.

- Instruction
    - Each student needs:
        - One clear plastic cup, baggie, spoon, three Oreos, two gummy worms, and four pretzel sticks
    - Start by separating the Oreos and scraping out the filling. Once the filling is out, put the Oreos in a bag and crush up into small pieces.
    - Put a *thin* layer of Oreo at the bottom of the clear plastic cup.
    - Next, put one spoon full of chocolate filling on top of the Oreos.
    - You are going to top the chocolate filling with Oreos and some of the multicolored sprinkles.
        - Students are adding the colors sprinkles to represent the abundant minerals that are present in swamps. These minerals allow organisms in swamps to be broken down easily, to prevent overpopulation.
    - Once the Oreo-sprinkle layer is down, add another filling layer, but use the *blue* filling this time.
        - The difference in color resembles the water of swamps.
        - This water area is predominately covered with trees, unlike marshes which are mostly herbaceous plants. These distinguishing characteristics are the main difference between the two.
    - Again, you are going to top the blue filling with a thin layer of Oreo crumbles.
    - On top of the last Oreo crumbles, top with gummy worms and stick pretzel sticks in the pudding.
        - Gummy worms represent the critters that find their homes in swamps.
        - The pretzels represent the trees that dominate swamps.
        - Swamps are often named after the types of trees that take up most of the swamp, such as hardwood and cypress swamps.

- As students enjoy their tasty treat, use this time to discuss the differences why swamps are so beneficial.

    - Swamps serve as *transitional* areas between land and water. Whether they are on the coastal regions or inland around rivers or lakes, they act as giant sponges. These areas catch overflowing water and serves as a protective layer to inland areas.
    - Think of what would happen if there was a huge rainfall event and there was nowhere for overflowing water to go around a lake. *Where would the water go if there were no swampy areas?* The same goes for coastal areas. Without these areas, land would be destroyed during hurricanes.
    - For a long period of time, wetlands were looked at as a wasteland. Officials tried draining them to prevent pesky insects like misquotes. They quickly learned that these areas where extremely crucial to inland areas.
    - Swamps also serve as a huge ecosystem for hundreds of different species of fish, insects, and even birds!

~Edible~ Marsh Cup

- Materials
    - Zip lock bags- sandwich size
    - Oreos
    - Gummy worms
    - Swedish fish
    - Chocolate pudding mix
    - Vanilla pudding mix
    - Milk
    - Whipped topping
    - Blue food coloring
    - Clear plastic cups
    - Whisk
    - Spoon
    - Green sprinkles

- Preparation- Preparation for this will be the same as the swamp cup. This needs to be done *at least* one hour prior to the lesson but can be sooner if needed.

- Instruction
    - Each student needs:
        - One clear plastic cup, baggie, spoon, three Oreos, two gummy worms, one Swedish fish
    - Start by separating the Oreos and scraping out the filling. Once the filling is out, put the Oreos in a bag and crush up into small pieces.
    - Put a thin layer of Oreo at the bottom of the clear plastic cup.
    - Next, put one spoon full of chocolate filling on top of the Oreos.
    - Cover the last Oreo layer with one more thin layer of chocolate filling then top with another Oreo layer.
        - These layers represent the dense soil of marshes.
        - The deepness of the soil makes the perfect environment for grasses and herbaceous plants to grow. The roots of the plants bind to the muddy soil.

        - The ability for lots of plants to grow in wetland areas like this slows the water down, which creates a largest marsh area.

- Top the Oreo layer with another thin layer of filling, but use the *blue filling* this time.

    - The difference in color resembles the water of marshes.

- Again, you are going to top the blue filling with Oreo crumbles.

- On top of the last Oreo crumbles, top with green sprinkles, gummy worms, and Swedish fish.

    - These green sprinkles represent the grassland that dominates marshes.
    - This would be a great opportunity to highlight that marshes are dominated by grassy areas and not trees. This is the main distinguishing factor between swamps and marshes.
    - Another important topic is that marshes are home to many different species of fish, insects, mammals, and birds! Depending on the type of marsh (fresh or salt water), depicts what different species call marshes home!

- As students enjoy their tasty treat, use this time to discuss the differences between the different types of marshes

    - What is the difference between *salt and freshwater marshes*? How are they the same?

        - Saltwater marshes are located on the coastal areas. They can be near bays and river mouths as well. The grassy areas of these marshes serve as a barrier between land and the ocean. Although marshes could never stop a hurricane, they can stop the surge to land and take some of the force away, protecting coastal areas from maximum areas. Most saltwater marshes are affected by the tide as well!
        - Freshwater marshes are farther inland than saltwater marshes. They can be found in open areas around rivers and lakes. After rainfall, water flows from bigger water sources into these wetlands. On average, freshwater marshes are only about 6ft deep. The largest freshwater marsh in the United States is the Florida Everglades! Like saltwater marshes, there are a ton of animals that call these home like mink, muskrats, beavers, turtles, frogs, insects, and birds!

❖ Conclusion

- If you choose to do both, compare how swamps and marshes are similar and different!

  - Both are transitional areas that are not fully land nor fully water.
  - They both serve as an ecosystem for many different species of animals.
  - Swamps and marshes are protection to inland areas no matter their location (salt water or freshwater)
  - Swamps are dominated by trees, whereas marshes are dominated mostly by grasslands.
  - Marshes have a very dense soil, which slows down the movement of water.

Second and Third Grade Activities

Ecosystem Mobile

- Materials:
  - Premade ecosystem cards
  - Paper towel roll, hanger, dowel to hang from
  - String
  - Markers/crayons/colored pencils
  - Scissors
  - Hole puncher
  - Standard printer
- Preparation:
  - Print out both the "element of a swamp ecosystem" and "properties of a swamp ecosystem" cards on plain white paper.
    - Students can also choose to get creative and make their own cards by using index cards or construction paper and drawing their own depiction of each element of a swamp ecosystem. If students choose to make their own, all their elements and properties should be the same (ex: wetland, soil, decomposition).
  - After each card it cut out, hole punch each out the top in the designated hole punch area.
- Instructions:
  - Students will be using a hanger to create & assemble their own swamp ecosystem.
    - Paper towel rolls, sticks from outside, or dowels can be substituted for the hanger.
  - Cut 5 pieces of string and tie each individual piece of string to the hanger
  - Next hang the "element" cards on the strings. Loop the string through the hole punched area and tie the cards on the strings.
    - Take this time to explain why the properties and elements are positioned as they are.
      - The *elements* represent what makes up a swamp ecosystem. These are the larger components. The ecosystem can be broken down past the elements into individual properties. The *property* cards are hanging below because these are examples of species that help make up make up *each individual ecosystem within a swamp*.
  - Cut 7 more pieces of string next. These pieces should be longer than the previous so that they will hang longer than the "elements of an ecosystem" cards.
  - Finally tie the "properties" cards on the longer pieces of string.
    - Have students try to sort and hang each "property" close to the "element" they think matches it the best.
    - For example—the bird card could hang between both the tree and grassland card, because birds use both tree and grassland habitats.

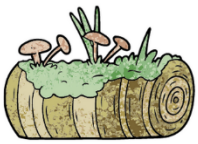
This is also good opportunity to explain to students about how different species use more than one habitat of the whole ecosystem to survive. Birds use trees for shelter and raising young as well as grasslands for hunting.

Elements of a Swamp Ecosystem

Trees

Wetland

Soil



Decomposition

Grassy Areas

Tree Frog

Whitetail Deer

Cottonmouth

Heron

Alligator

Termite

Alligator

Crocodile

Identification T Chart

Name: _____

Traits

Only teeth from the upper jaw can be seen

Can be found in fresh, brackish, and salty waters

Has a V-shaped snout and narrower head

Has countershading camouflage to help hide for ambushing prey

Only has two different species

Has the largest species that can reach lengths of 20ft and weights up to 2,000lbs

Band Aid Firefly Craft

Materials

- Black sheet of construction paper
- Yellow and White crayon
- Colorful band-aids
- Plain band-aids
- Glue
- Wiggly eyes
- Yellow puffy paint

Directions

- Draw a moon and stars on your black sheet of construction paper
- Place the plain band aids on the paper to serve as the body of your fireflies
- Take two colored bandaids of the same color and place the over the body, forming an "X" to make the wings
- Glue the wiggly eyes onto the top of your fireflies. You can use a marker to add more details to the faces if you'd like
- Use the yellow crayon to draw antennae on the fireflies
- Use the yellow puff paint on the bottom of the fireflies to create a 3D effect glow.

~Edible~ Swamp Cup

- Materials
  - Zip lock bags- sandwich size
  - Oreos
  - Gummy worms/frogs
  - Chocolate pudding mix
  - Vanilla pudding mix
  - Milk
  - Whipped topping
  - Blue food coloring
  - Clear plastic cups
  - Whisk
  - Spoon
  - Multicolored sprinkles
  - Pretzel sticks

- Preparation- This needs to be done *at least* one hour prior to the lesson but can be sooner if needed.

  - You are going to need to make both a chocolate pudding and vanilla pudding for this activity. You will be adding blue food coloring to the vanilla pudding to represent the water of the marsh.

  - You can always double or triple the amount depending on the size of the group.

    6. In a medium bowl whisk together chocolate pudding mix and 2 cups milk in a medium bowl for 2 minutes. Let stand 5 minutes.
    7. Fold in whipped topping into chocolate pudding.
    8. Whisk together vanilla pudding mix and milk in a medium bowl for 2 minutes.
    9. Add blue food coloring next. You can add any desired amount of the color for any shade of blue.
    10. After the vanilla pudding is colored, fold in whipped topping into the blue pudding. Let stand for 5 minutes.

- Instruction
    - Each student needs:
        - One clear plastic cup, baggie, spoon, three Oreos, two gummy worms, and four pretzel sticks
    - Start by separating the Oreos and scraping out the filling. Once the filling is out, put the Oreos in a bag and crush up into small pieces.
    - Put a *thin* layer of Oreo at the bottom of the clear plastic cup.
    - Next, put one spoon full of chocolate filling on top of the Oreos.
    - You are going to top the chocolate filling with Oreos and some of the multicolored sprinkles.
        - Students are adding the colors sprinkles to represent the abundant minerals that are present in swamps. These minerals allow organisms in swamps to be broken down easily, to prevent overpopulation.
    - Once the Oreo-sprinkle layer is down, add another filling layer, but use the *blue* filling this time.
        - The difference in color resembles the water of swamps.
        - This water area is predominately covered with trees, unlike marshes which are mostly herbaceous plants. These distinguishing characteristics are the main difference between the two.
    - Again, you are going to top the blue filling with a thin layer of Oreo crumbles.
    - On top of the last Oreo crumbles, top with gummy worms and stick pretzel sticks in the pudding.
        - Gummy worms represent the critters that find their homes in swamps.
        - The pretzels represent the trees that dominate swamps.
        - Swamps are often named after the types of trees that take up most of the swamp, such as hardwood and cypress swamps.

- As students enjoy their tasty treat, use this time to discuss the differences why swamps are so beneficial.

    - Swamps serve as *transitional* areas between land and water. Whether they are on the coastal regions or inland around rivers or lakes, they act as giant sponges. These areas catch overflowing water and serves as a protective layer to inland areas.
    - Think of what would happen if there was a huge rainfall event and there was nowhere for overflowing water to go around a lake. *Where would the water go if there were no swampy areas?* The same goes for coastal areas. Without these areas, land would be destroyed during hurricanes.
    - For a long period of time, wetlands were looked at as a wasteland. Officials tried draining them to prevent pesky insects like misquotes. They quickly learned that these areas where extremely crucial to inland areas.
    - Swamps also serve as a huge ecosystem for hundreds of different species of fish, insects, and even birds!

~Edible~ Marsh Cup

- Materials
    - Zip lock bags- sandwich size
    - Oreos
    - Gummy worms
    - Swedish fish
    - Chocolate pudding mix
    - Vanilla pudding mix
    - Milk
    - Whipped topping
    - Blue food coloring
    - Clear plastic cups
    - Whisk
    - Spoon
    - Green sprinkles

- Preparation- Preparation for this will be the same as the swamp cup. This needs to be done *at least* one hour prior to the lesson but can be sooner if needed.

- Instruction
    - Each student needs:
        - One clear plastic cup, baggie, spoon, three Oreos, two gummy worms, one Swedish fish
    - Start by separating the Oreos and scraping out the filling. Once the filling is out, put the Oreos in a bag and crush up into small pieces.
    - Put a thin layer of Oreo at the bottom of the clear plastic cup.
    - Next, put one spoon full of chocolate filling on top of the Oreos.
    - Cover the last Oreo layer with one more thin layer of chocolate filling then top with another Oreo layer.
        - These layers represent the dense soil of marshes.
        - The deepness of the soil makes the perfect environment for grasses and herbaceous plants to grow. The roots of the plants bind to the muddy soil.

        - The ability for lots of plants to grow in wetland areas like this slows the water down, which creates a largest marsh area.

- Top the Oreo layer with another thin layer of filling, but use the *blue filling* this time.

    - The difference in color resembles the water of marshes.

- Again, you are going to top the blue filling with Oreo crumbles.

- On top of the last Oreo crumbles, top with green sprinkles, gummy worms, and Swedish fish.

    - These green sprinkles represent the grassland that dominates marshes.
    - This would be a great opportunity to highlight that marshes are dominated by grassy areas and not trees. This is the main distinguishing factor between swamps and marshes.
    - Another important topic is that marshes are home to many different species of fish, insects, mammals, and birds! Depending on the type of marsh (fresh or salt water), depicts what different species call marshes home!

- As students enjoy their tasty treat, use this time to discuss the differences between the different types of marshes

    - What is the difference between *salt and freshwater marshes*? How are they the same?

        - Saltwater marshes are located on the coastal areas. They can be near bays and river mouths as well. The grassy areas of these marshes serve as a barrier between land and the ocean. Although marshes could never stop a hurricane, they can stop the surge to land and take some of the force away, protecting coastal areas from maximum areas. Most saltwater marshes are affected by the tide as well!
        - Freshwater marshes are farther inland than saltwater marshes. They can be found in open areas around rivers and lakes. After rainfall, water flows from bigger water sources into these wetlands. On average, freshwater marshes are only about 6ft deep. The largest freshwater marsh in the United States is the Florida Everglades! Like saltwater marshes, there are a ton of animals that call these home like mink, muskrats, beavers, turtles, frogs, insects, and birds!

❖ Conclusion

- If you choose to do both, compare how swamps and marshes are similar and different!

  - Both are transitional areas that are not fully land nor fully water.
  - They both serve as an ecosystem for many different species of animals.
  - Swamps and marshes are protection to inland areas no matter their location (salt water or freshwater)
  - Swamps are dominated by trees, whereas marshes are dominated mostly by grasslands.
  - Marshes have a very dense soil, which slows down the movement of water.

Fourth and Fifth Grade Activities

Ecosystem Mobile

- Materials:
  - Premade ecosystem cards
  - Paper towel roll, hanger, dowel to hang from
  - String
  - Markers/crayons/colored pencils
  - Scissors
  - Hole puncher
  - Standard printer
- Preparation:
  - Print out both the “element of a swamp ecosystem” and “properties of a swamp ecosystem” cards on plain white paper.
    - Students can also choose to get creative and make their own cards by using index cards or construction paper and drawing their own depiction of each element of a swamp ecosystem. If students choose to make their own, all their elements and properties should be the same (ex: wetland, soil, decomposition).
  - After each card it cut out, hole punch each out the top in the designated hole punch area.
- Instructions:
  - Students will be using a hanger to create & assemble their own swamp ecosystem.
    - Paper towel rolls, sticks from outside, or dowels can be substituted for the hanger.
  - Cut 5 pieces of string and tie each individual piece of string to the hanger
  - Next hang the “element” cards on the strings. Loop the string through the hole punched area and tie the cards on the strings.
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    - Have students try to sort and hang each “property” close to the “element” they think matches it the best.
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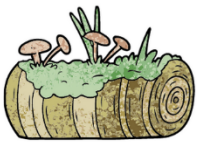
This is also good opportunity to explain to students about how different species use more than one habitat of the whole ecosystem to survive. Birds use trees for shelter and raising young as well as grasslands for hunting.

Elements of a Swamp Ecosystem

Trees

Wetland

Soil



Decomposition

Grassy Areas

Tree Frog

Whitetail Deer

Cottonmouth

Heron

Alligator

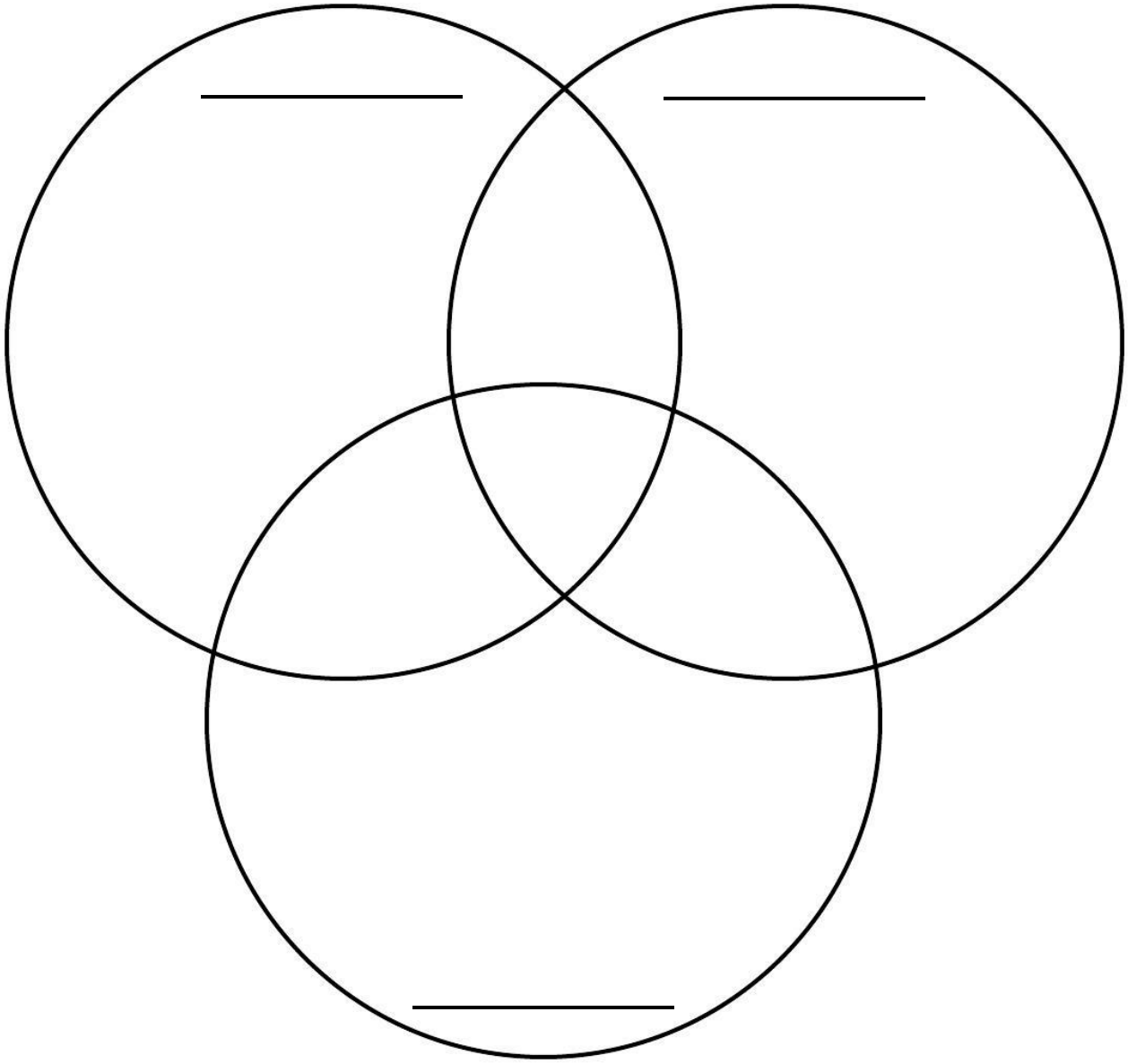
Termite

Student Name:

Swamps, Marshes, & Bogs Oh My!

In the bubbles below, label them individually “Swamps”, “Marshes”, “Bogs”.

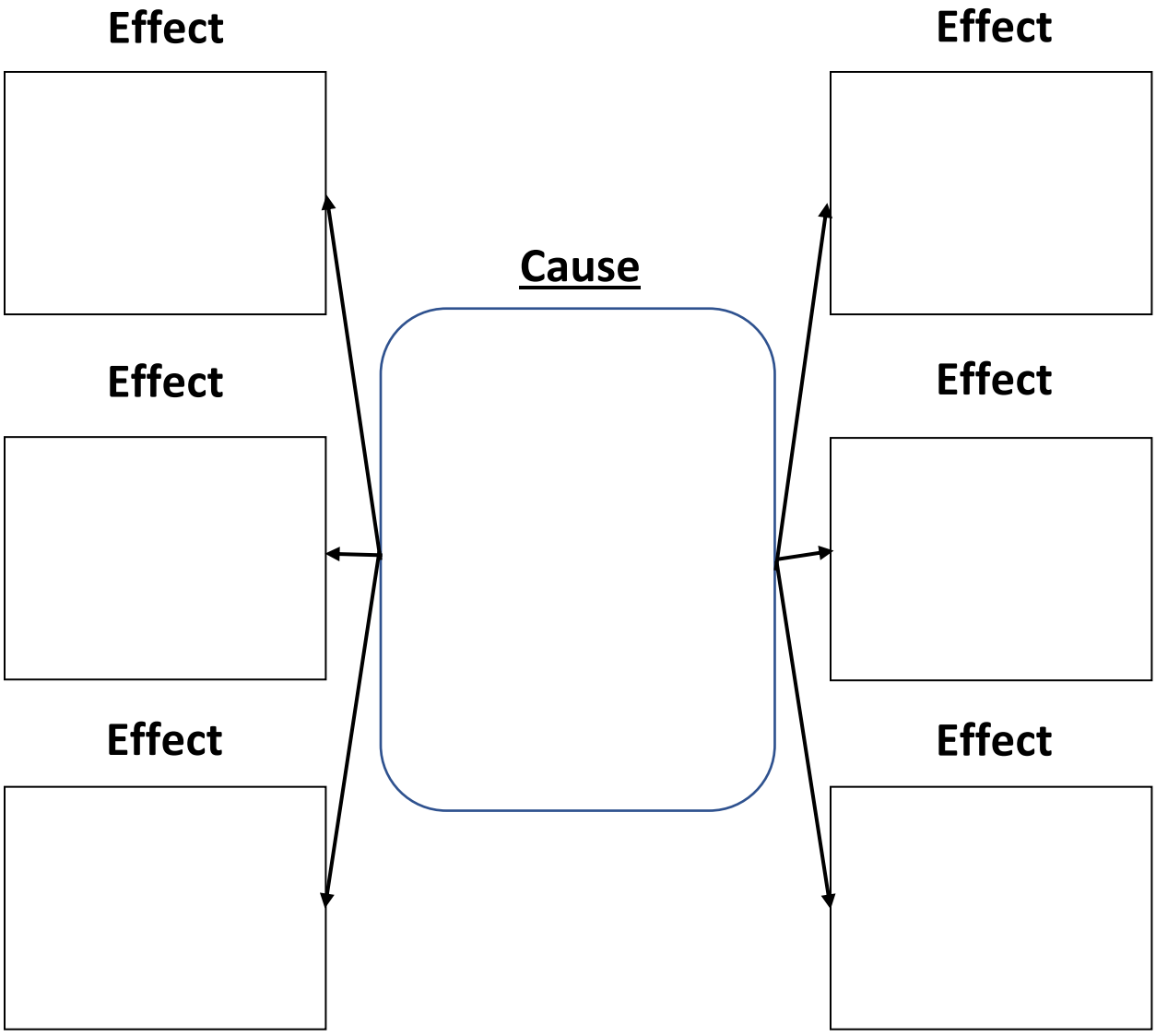
In overlap zones, write in facts that are shared by two of or all three options.



What else do you want to know?

Cause & Effects

Name: _____ **Date:** _____



_____

_____

_____

_____

~Edible~ Swamp Cup

- Materials
  - Zip lock bags- sandwich size
  - Oreos
  - Gummy worms/frogs
  - Chocolate pudding mix
  - Vanilla pudding mix
  - Milk
  - Whipped topping
  - Blue food coloring
  - Clear plastic cups
  - Whisk
  - Spoon
  - Multicolored sprinkles
  - Pretzel sticks

- Preparation- This needs to be done *at least* one hour prior to the lesson but can be sooner if needed.

  - You are going to need to make both a chocolate pudding and vanilla pudding for this activity. You will be adding blue food coloring to the vanilla pudding to represent the water of the marsh.

  - You can always double or triple the amount depending on the size of the group.

    11. In a medium bowl whisk together chocolate pudding mix and 2 cups milk in a medium bowl for 2 minutes. Let stand 5 minutes.
    12. Fold in whipped topping into chocolate pudding.
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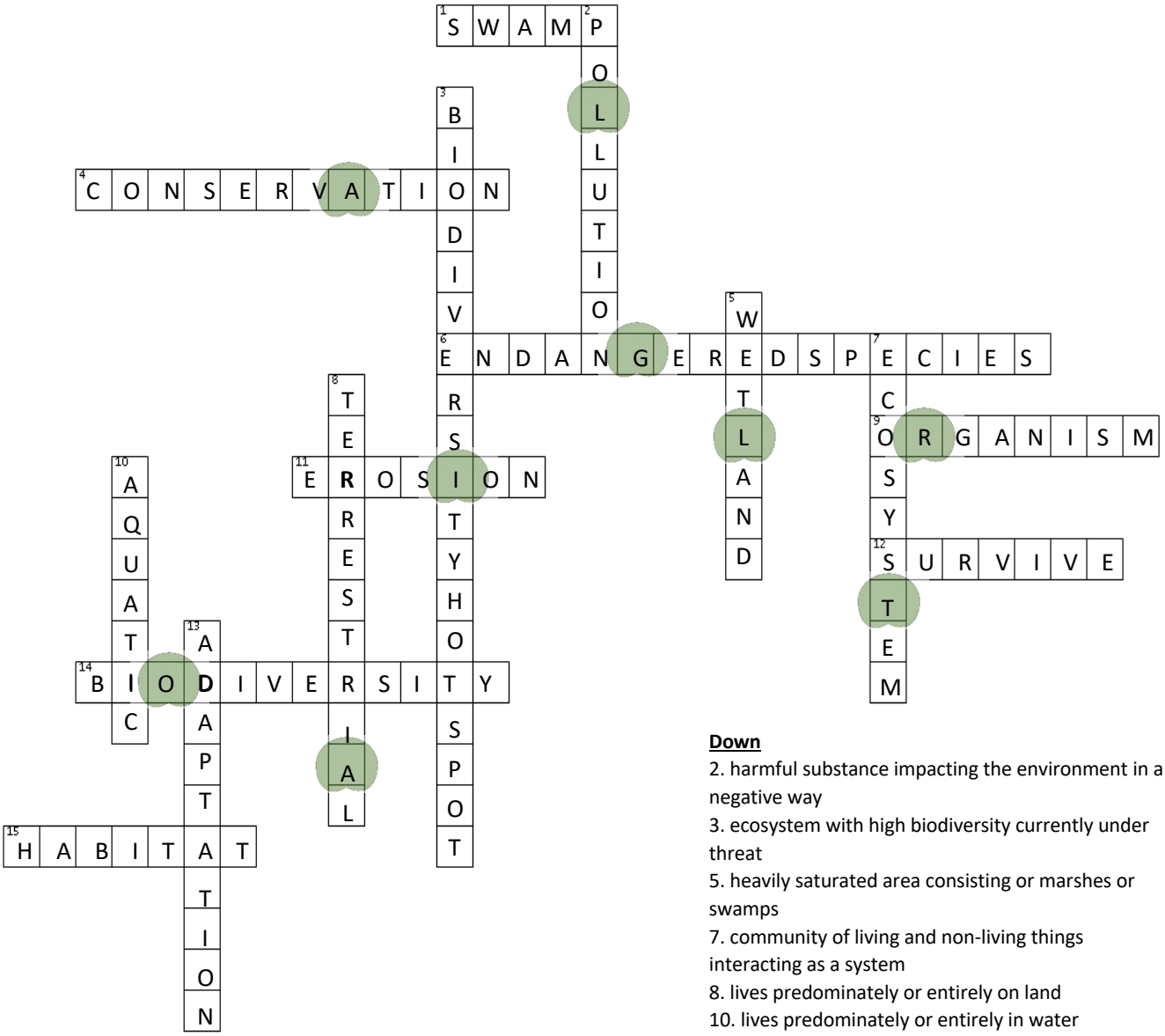
Completed Worksheets

Hidden Message Among The Lily Pads



Across

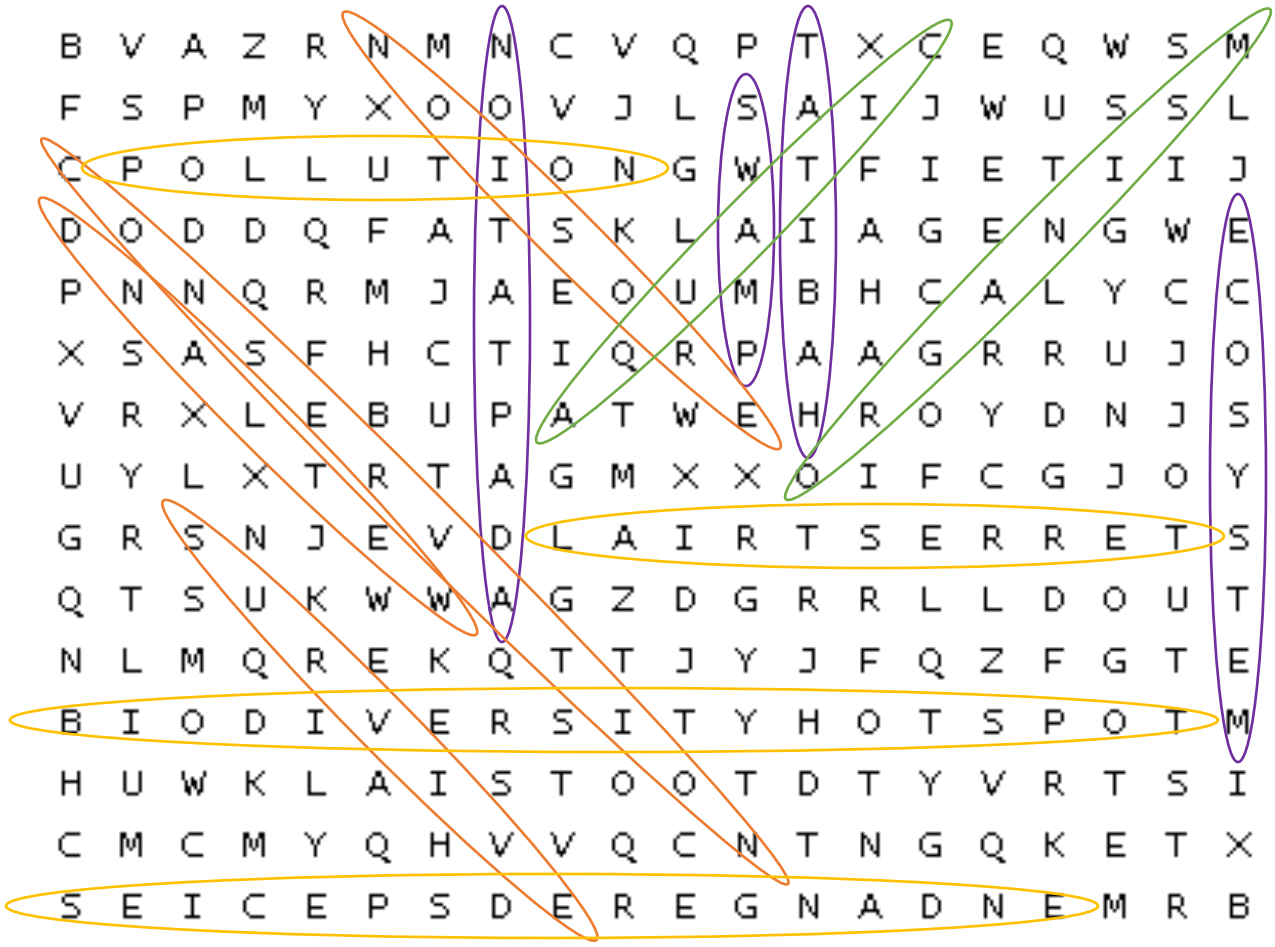
1. often considered as transitional zones between land and water
4. prudent use without waste
6. a species in danger of going extinct
9. an individual living thing
11. process where natural forces break something down over time
12. continuing to live in spite of danger or hardship
14. many different organisms living together in a particular ecosystem
15. the natural home of a living thing

Down

2. harmful substance impacting the environment in a negative way
3. ecosystem with high biodiversity currently under threat
5. heavily saturated area consisting or marshes or swamps
7. community of living and non-living things interacting as a system
8. lives predominately or entirely on land
10. lives predominately or entirely in water
13. traits that allow organism to be better suited for survival

Swamp Search

Student Name:_____



-Adaptation	**-Aquatic Animals**	**-Biodiversity**	**-Conservation**
-Ecosystem	**-Endangered Species**	**-Erosion**	**-Habitat**
-Organism	**-Pollution**	**-Survive**	**-Swamp**
-Terrestrial Animals	**-Wetland**		