K-2 Habitat Hop Activity

South Carolina Aquarium

Overview

Focus Question
What is a habitat? What do living things need from their habitat?

Activity Synopsis
Students will learn about what a living thing needs in order to survive in a habitat as well as get acquainted with a pond and forest habitat. They will play a hopping game and see if their animal can find all of its needs to survive in its habitat.

Time Frame
45 minutes

Objectives
The learner will be able to:

- Define the word habitat
- Determine the needs of living things
- Identify a frog and a toad
- Identify a water lily and oak tree
- Be familiar with pond and forest habitats

Student Key Terms

- air
- food
- gills
- habitat
- living thing
- lungs
- shelter
- space
- water

Teacher Key Terms

- *Anura*
- biodiversity
- carnivore
- conservation
- consumer
- decomposer
- diffusion
- food chain
- herbivore
- invasive
- native
- photosynthesis
- producer

Standards

South Carolina College- and Career-Ready Science Standards 2021

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Kindergarten: K-LS1-1, K-ESS3-1, K-ESS3-3
1st Grade: 1-LS1-1
2nd Grade: 2-LS2-1, 2-LS4-1, 2-ESS2-2, 2-ESS2-3, 2-ESS3-1

*** Bold standards are the main standards addressed in this activity**

Kindergarten Performance Expectations
K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.
K-ESS3-1 Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
K-ESS3-3 Obtain and communicate information to define problems related to human impact on the local environment.

First Grade Performance Expectations
1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Second Grade Performance Expectations
2-LS2-1 Plan and conduct an investigation to determine what plants need to grow.
2-LS4-1 Make observations of plants and animals to compare patterns of diversity within different habitats.
2-ESS2-2 Develop a model to represent the shapes and kinds of land and bodies of water in an area.
2-ESS2-3 Obtain information to identify where water is found on Earth and that it can be solid or liquid.
2-ESS3-1 Design solutions to address human impacts on natural resources in the local environment.

Cross Curricular Standards

South Carolina College and Career Standards for Math
K.ATO.1, K.ATO.2, 1.ATO.1, 1.ATO.2, 2.ATO.1

South Carolina College and Career Standards for Social Studies
K.H.1, K.E.1

South Carolina College and Career Standards for ELA
Inquiry (I) – K-1.1, 1-1.1, 2-1.1
Reading Informational Text (RI) – K-3.1, 1-3.1, 2-3.1, K-3.2, K-3.3, K-4.3, K-8.1, 1-8.1, K-9.1, 1-9.1, K-9.2, 1-9.2
Writing (W) – K-2.1, 1-2.1, 2-2.1, K-6.1, 1-6.1, 2-6.1, K-6.2, 1-6.2, 2-6.2, K-6.3, 1-6.3, 2-6.5
Communication (C) – K-1.1, 1-1.1, 2-1.1, K-1.2, 1-1.2, 2-1.2, K-1.4, 1-1.4, 2-1.4

Background

Key Points
Key Points will give you the main information you need to teach the activity.

- A **habitat** is a place where an organism can get the **air**, **food**, **water** and **shelter/space** it needs to survive.
- These needs look different for different **living things**.
    - Animals use **lungs** or **gills** to get oxygen from air (air in atmosphere or air/oxygen in water). Plants need carbon dioxide from air for **photosynthesis**.
    - Animals need energy from food to grow. Plants use the suns energy to produce their own food. Plants also need nutrients ("food") to grow.
    - Plants and animals need freshwater, saltwater, or brackish water depending on the species.
    - Animals need shelter for protection. Plants need space to grow.

- Any place where air, food, water and shelter/space are available has the potential to be habitat for an organism. If an organism can obtain each of these things, even where they are scarce, it is still a good habitat.
- Common South Carolina habitats include the ocean, beach, saltmarsh, pond, swamp and forest. This activity focuses on pond and forest habitats.
- A pond is a small body of fresh water, usually surrounded by grass and trees. Water lilies are common plants in a pond.
- A forest is a large area of land dominated by tall trees and plants. Oak trees are common in a forest.
- Adult American bullfrogs live in freshwater of ponds as one of their primary habitats. They get air, food, water, and shelter in this habitat and other freshwater habitats.
- Adult Southern toads live on land in forests as one of their primary habitats. They get air, food, water, and shelter in this habitat and other dry habitats with access to freshwater for laying eggs.

Detailed Information
Detailed Information gives more in-depth background to increase your own knowledge, in case you want to expand upon the activity or you are asked detailed questions by students.

A **habitat** is the place where a **living thing**, an organism, can get all the things it needs to survive. Organisms need **air**, **food**, **water** and **shelter**/**space** to survive. The Earth has great variability in climate, topography and accessibility of water. Despite this variability, almost every part of the planet is a habitat for some living thing because living things have evolved great variability in body structures and behaviors.

A habitat can be as large as continents (for the birds that migrate from South America to North America) or entire oceans (for migrating fish, sea turtles and whales) or as small as a moist piece of bread (for fungus) or your intestines (for the bacteria that help you digest your food). Put a fish on land or a squirrel in the ocean, though, and suddenly they are in big trouble. It is not a suitable habitat for them because they are not built to get air, food and water from this type of environment.

Air can be found all over the Earth. Air in the atmosphere is made up of about 78% nitrogen, 20% oxygen, 1% argon, 0.04% carbon dioxide and a small percentage of other gases (neon, helium and methane). Animals depend on atmospheric oxygen to breathe using their **lungs**. Plants need carbon dioxide for **photosynthesis**. Animals that live in water get their air (oxygen) from the water (H2O). These animals use **gills** to breathe underwater like a fish or **diffusion** through their body like a sea star.

Food is an important need for all living things. Without energy, no living thing can withstand life for too long. Animals consume their food for energy, whereas plants make their own food using energy from the sun (photosynthesis), water and carbon dioxide. Plants also soak up nutrients from the environment, which act as “food” to help the plant grow. This is why animals are called **consumers** in the **food chain** and plants are called **producers**. Food to organisms can be a dead lion decaying in the sun, an acorn from a tree, berries from a bush or a mouse hiding in the forest. It is important for **biodiversity** to remain high on Earth so that all organisms can find a source of food.

Water is necessary for all life. Humans should drink 8 glasses of water a day. Some animals live in water and therefore need it for drinking as well as their shelter. The 3 main types of water are freshwater, saltwater and brackish water (the mixture of fresh and salt water). Freshwater is found in ponds, lakes, rivers, streams, swamps, and more habitats. Saltwater is found in the ocean. Brackish water is found in estuaries, harbors, saltmarshes and more. Most organisms can only survive by living in or drinking one type of water (fresh or salt). Some organisms are adapted to survive in a variety of salinities (amount of salt) such as a stingray or dolphin.

Shelter and space are often confused. Animals need shelter in order to protect them from the elements or a predator. Shelters can be a log for a snake to hide under or dark water for an alligator to camouflage. Plants needs space in order to grow. Some plants need a small amount of space to thrive (like a palm tree) where as some plants have roots that spread 50 feet for stability (cypress tree).

Even in environments that are limited in certain crucial needs, organisms evolve methods to find enough of those things to make that environment their habitat. For example there is much more oxygen in the atmosphere than in oceans and yet oceans are teeming with life. This is because animals living in the ocean have adaptations that allow them to pull air out of the water. Another example is deserts with little water in them but still support life. When camels find water, they can drink 20 gallons at a time and store this water in the fat in their humps. They can then go weeks without water, living off their storage hump. Cacti have shallow roots that extend a

great distance from the plant and allow the cactus to collect a lot of water during the brief rainy periods. The water is stored in the thick stems for dry times.

South Carolina is a very small state in relation to the other states (40th state in size), yet because of its varied topography and landform regions, South Carolina has many different types of habitats and therefore many different species (15th state in biodiversity. This activity focuses on the pond and forest habitats.

SC Habitat	Description	Type of Water	Common Organisms
Forest/Woods	**Large area covered by trees and other vegetation**	**Fresh**	**Songbirds, birds of prey, trees, snakes, lizards, mice, deer, squirrels**
Pond	**Small body of standing water (smaller than a lake)**	**Fresh**	**Cattails, grasses, lily pads, frogs, turtles, fish, insects, snakes**
**To learn about more habitats in SC and around the world refer to the K-2 Habitats Online Curriculum activity.*			

Pond Background

A pond is a small body of water, usually surrounded by grass and trees. Ponds can be natural or made by humans. Ponds are very similar to lakes except they are much smaller in size. South Carolina has many ponds, both natural and man-made. Humans make ponds for many reasons including rain water collection for flooding control and to make a habitat look nice. A pond is a great habitat for many organisms and provides beauty to an environment.

Most ponds contain freshwater. They are also usually shallow and the suns energy can reach the bottom. The surrounding area of a pond provides wonderful shelter for the animals that live in the water and on land. Insects thrive in a pond and can be seen on the water's surface such as a water strider, within the water like a mayfly and near the water with butterflies, beetles and ants. Frogs, like the bullfrog, can complete their whole life cycle in this environment, starting out as eggs in the water that hatch into tadpoles which develop over time into frogs. The most common animals found in the pond are the many fishes. Small sized fish like the bluespotted sunfish, medium sized fish such as the bluegill and larger fish called largemouth bass are only three of the many types of fish found in a pond. Turtles are also very common in ponds. Yellow-bellied sliders and chicken turtles are just two examples that love to swim in the water with their webbed feet and climb out of the water onto logs in order to sun themselves and get warm. Snakes such as corn snakes, rat snakes and king snakes can all call a pond home. Many mammals love to live around a pond because of all the prey items they can hunt. Raccoons, river otters and deer are a few examples. Flying in the sky around ponds are song birds such as cardinals and blue jays as well as birds of prey like the bald eagle and hawk.

Plants typically live around the pond such as grass and trees. Some plants even grow right inside the water's edge such as cattails. Lilly pads are another common plant that float on the surface and provide a great place for frogs and other animals to sit and hide. Another plant common to a pond is phytoplankton. Phytoplankton are microscopic plants that float in the water. All plants in the pond rely on the sun for energy to photosynthesize. Photosynthesis is the process of plants taking carbon dioxide and water to produce oxygen and sugar (food for plants).

One highlighted plant that lives in the pond is the Fragrant water-lily (*Nymphaea odorata*). The water lily has free-floating circular leaves that are shiny green on top and dull purple on the underside. The stomata, the tiny openings on the leaf surface through which carbon dioxide and other gases pass into the plant, are on the upper side of the water lily. Most dry-land plants have stomata on the lower surface of the plant leaves. The water lily can grow in up to 8 feet of water and is anchored to the bottom of the pond by a soft, spongy leaf stalk or stem. This stem is connected to a thick rhizome (root) that is a food source to some animals like muskrats. This plant flowers in the evenings June to September with a white, fragrant flowers that attract insects like flies, bees and beetles to pollinate the flowers. This initiates seed pod formation for future water lilies. A water lily seed pod forms underwater and can contain up to 2,000 seeds. Water lilies also reproduce through their rhizome roots with offshoots of new plants. Many animals use water lilies as a shelter and hiding place in the pond habitat. Other animals like snails, beetles, deer, some fish and some turtles use the water lilies as a food source.

Forest Background

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A forest is a large area dominated by tall trees, usually with understory shrubs, bushes or small plants close to the ground. Another common term for forests is woods. South Carolina has many forests with hardwoods like maple and oak trees and evergreens like spruces and pine trees. Forest can be naturally developed or planted by humans for paper and wood products. A forest is a great habitat for many organisms and provides beauty to an environment along with many renewable resources for human use.

Most forests contain freshwater with streams, creeks, or even ponds nearby. Freshwater can also be found at a forest in rain puddles or morning dew on leaves. While the sun's energy is captured mostly by the leaves of the tall trees, light that filters down to the forest floor provides energy for smaller plants below. Plants, fallen leaves, and logs provide wonderful shelter for many animals that live in the forest.

Many animals live in a forest habitat. Insects thrive in a forests and can be heard buzzing throughout from lightning bugs, moths, butterflies and dragonflies to wasp, bees, mosquitos, beetles and crickets. Many insects and other invertebrates are often special consumers that eat dead plant and animal matter. Fungi, bacteria, and some invertebrates consume dead organisms and return nutrients back into ecosystem for producers to use again. The soil in the forest is nutrient rich from decaying matter and provides the nutrients (food) plants need to thrive. Birds like American robins and turkeys frequent on the ground searching for food others use the trees for shelter like Barred owls, Red-tailed hawks, Downy wood peckers, Blue jays, and Mockingbirds. The trees can be a shelter for some snakes like a corn snake or rat snake, but others are more frequently on the ground like king snakes and rattle snake. Other snakes burrow underground like the Eastern hognose snake. More common reptiles include Eastern box turtles, Carolina anole lizards, and skinks. Toads are a common sight in forests. Toads find shelter by kicking up loose soil, finding a burrow or hiding among leaf litter or logs. Many mammals love to live in a forest because of all the prey items they can hunt. Squirrels, deer, raccoons, opossums, skunks, coyotes, and black bears are a few examples.

Typical trees in SC forest include Sweet gum, American holly, American sycamore, Southern red cedar, Eastern redbud, and a variety of pine and oak species. Other plants include Carolina jessamine and Muscadine grape vines, wild azaleas and Beauty-berry bushes, and low flowers and plants like ferns, violets, Partridge berry and trilliums. All plants in the forest rely on the sun for energy to photosynthesize. Photosynthesis is the process of plants taking carbon dioxide and water to produce oxygen and sugar (food for plants).

One great plant to highlight that lives in the forest is oak trees. There are a variety of oak species (about 90 species in North America). The two basic types are red and white oaks. All oaks are known for their seed, the acorns. Chestnut oaks (*Quercus montana*) are a type of white oak found in the Piedmont and Mountains of South Carolina. Swamp Chestnut oaks (*Quercus michauxii*) are a type of white oak found in the Piedmont, Sandhills, Coastal Plains, and Coast of South Carolina. Both of these species can reach around 80 feet tall with broad deciduous leaves, leaves that fall off in the Autumn and new leaves grow on them in the Spring. Oaks do flower and then form their fruit (seed) the acorn which is about 1 ½ inches long. Many animals like deer, wild turkeys, squirrels, rabbits, opossums, blue jays, quail, and raccoons depend on acorns as a food source. As twigs and limbs fall from the tree and leaves fall in Autumn the leaf litter created below works as an excellent shelter for many animals including snakes, insects, turtles, and even toads. Fallen logs and decaying trees work as a food sources for insects, worms, and other **decomposers**. These logs and decaying trees also work as shelters for animals to hide in from raccoons to owls.

<u>Frog and Toad Background</u>

Due to the diversity in habitats across the Southeast United States there is also a great diversity of 42 different species of frogs and toads in this area. Students will focus on adult Southern toads that live on land often in forest and adult American bullfrogs that live in freshwater often in ponds.

There is no scientific difference between frogs and toads. In general the term "toad" refers to the shorter-legged, drier bumpy skinned species that are more terrestrial. The term "frog" refers to the longer-legged, smooth and slimy species that are more aquatic. Frogs have teeth and toads do not. Frogs are longer and more streamline. Toads are stockier and have well developed parotoid glands, glands behind their eyes that can secrete toxins to deter predators. Frog and toads all belong to the **Anura** order.

There are 5,000 species of frogs and toads in the world with many more still undiscovered. There are about 100 species in the United States there and about half of that (42 known species of frogs and toads) are found in the Southeastern United States. Among the anurans (frogs and toads) species of the Southeast include American bullfrog, Leopard frog, Gopher frog, River frog, Spring peeper, Cricket frog, Chorus frog, Tree frogs, Pickerel frog, Pig frog, Spadefoot toad, Eastern narrow-mouth toad, Southern toad, and many

more. Anurans (frogs and toads) can be identified by their vocalizations. Recordings of a variety of frog calls can be found at http://srelherp.uga.edu/anurans/. Frogs make their distinctive sounds with a single vocal sac below the chin or paired vocal sacs located on the sides of the head. Vocalizations are for communication – mating, territory, distress calls, and even rain calls.

Frogs and toads are amphibians which means "both lives" and refers to their life cycle beginning as an aquatic larval state and developing to a terrestrial adult state. Frogs and toads both begin as eggs. Females lay eggs in an aquatic environments and males externally fertilize the eggs. Frogs lay eggs in clusters and toads lay eggs in long strings. Eggs develop quickly and within a few days tadpoles hatch. Tadpoles undergo metamorphosis that typically takes 2-3 months, but varies dramatically by species. Tadpoles breath with gills, swim with a long tail, and eat a **herbivore** diet of algae, plants, and sometimes detritus (organic material) from the bottom of ponds. Hind limbs form first. Then forelimbs emerge. Finally the tail is reabsorbed. Internally the tadpole changes from a herbivore digestive system to a carnivore diet. Gills are reabsorbed and lungs form. Then the adult form of the frog or toad forms as they consume prey and grow.

Frogs and toads in general eat plants and detritus as tadpoles, but as adults are **carnivores**. They are generalist and will eat any animal they can capture and **consume**. Due to size most frogs and toads consume large quantities of insects including mosquitoes. Larger frogs and toads eat larger animals. Large Southern toads could eat beetles, earwigs, ants, cockroaches, mole crickets, snails, and even worms and small snakes. American bullfrogs (the largest native frog) can consume anything that fits in its mouth. This includes insects, dragonflies, crustaceans, crayfish, salamanders, tadpoles, frogs, fish eggs, worms, small water snakes, mice, and even young birds. Frogs and toads are an important food source to many other animals and could be eaten by snakes, birds, turtles, newts, sirens, raccoons, and even other frogs and toads. Defenses include frogs using long legs jumping far distances to get away, toads puffing up to look big and secreting toxic chemicals through their skin, and both being camouflaged with specialized coloration for their habitat. While all living things need water, anuras are unique in how they get it. Frogs and toads do not drink water with their mouth, instead they absorb water through a patch of skin on their underside.

American bullfrogs are the largest true frog **native** to North America. Bullfrog tadpoles can reach 6 inches long and adults range from 3.5 - 8 inches. Due to large size and wide mouth of the bullfrog, it is known to eat many reptiles, snakes, small alligators, crayfish, turtles, other frogs, birds, and even small mammals. Bullfrogs can be found in a variety of freshwater aquatic habitats – man-made ponds, lakes, reservoirs, slow-moving rivers, ditches, and swamps. While native to the southeast, they are **invasive** in the Western United States. They are nocturnal and are often found on the edge of a pond or in shallow water. When disturbed they jump quickly in the water. They have long legs that aid them in jumping long distances. Bullfrogs typically jump 3 feet, but are able to jump 6 feet without difficulty. In the winter they hibernate underwater buried in the mud. Bullfrogs breed March to October. The vocalization of a bullfrog is a loud, low-pitched *"jug-a-rum"* or *"brrruuuumm"* call. The tympanum (external eardrum) is the circle behind the frog's eyes. Males have larger eardrum circles and females have smaller circles. Female Bullfrogs can lay 12,000-20,000 eggs at a time. These eggs hatch in 3-5 days and the tadpole stage can last for a few months to more than 2 years. Once adults Bullfrogs can fall prey to alligators, snakes, herons, and raccoons. Bullfrogs could live up to 15 years in the wild.

Southern toads are common throughout the southeast region of the United States. Tadpoles are less than ½ inch long and adults reach 1.5 - 3 inches. Southern toads can be found in a variety of terrestrial habitats that have access to water for breeding– forests, open fields, clear-cut forests, residential areas, and agriculture areas. They have a preference for sandy soil that they can burrow in during the day and hibernate in burrows up to 1 foot deep during the winter. Southern toads also hide under forest leaf litter, under logs, or in burrows from other animals. Southern toads find food from dusk and throughout the night. They eat snail and insects including mosquitos, ants, beetles, lightning bugs, mole crickets, honeybees, and even roaches. Southern toads have shorter legs than frogs (relative to their body size) and prefer shorter hops and walking. Southern toads have a dry bumpy skin. Despite the common myth, you will not get warts from touching a toad. Southern toads breed as early as February to May, before snakes and other predators are active. Breeding continues until October. The vocalization of a Southern toad is a high-pitched whistle like trill. Males are smaller and dark-throated and females are paler and larger. Female Southern toads can lay up to 3,000 eggs at a time in two long stings in shallow freshwater. These eggs hatch in a 2-4 days and the tadpole stage can last for 1-2 months. Once adults Southern toads can fall prey to snakes, turtles, giant water bugs, herons, raccoons, and other frogs. When threatened they inflate their body and bend forward to show off their parotoid glands behind their eardrums that are poisonous or at least unpalatable. Southern toads could live up to 10 years in the wild.

Because animals are dependent on habitat availability, we know that habitat loss is the main reason animals become extinct. Habitat loss can occur from natural processes such as hurricanes or volcanic eruptions. In recent centuries, though, it is the expansion of

humans that has led to cataclysmic habitat loss. Not just urban development, but human activities such as farming, logging and mining take away the space other organisms need to survive. Pollution contaminates water and air which is another loss of habitat for organisms. Organisms with specialized habitat needs, such as wood storks or shortnose sturgeon, begin to die out, while organisms that use urban areas, such as pigeons, squirrels and cockroaches, thrive. The changes we make in the environment drastically reduce the habitat for other species.

All living things need food, water, air and shelter/space, but they all have different methods of obtaining them. For this reason, every place on Earth is potential habitat as long as small amounts of these essential things are available. By preserving habitats, we help preserve other species and the biodiversity on Earth. Preserving biodiversity ultimately protects what you need as a human being. The air you breathe comes from plants, food comes from both plants and animals, water comes from freshwater sources in environment, and shelter is made from plants and resources from the ground. Conservation of our natural world and protecting species within it is the key for protecting our own survival as a species.

Procedure

Materials

- Habitat Hop Intro (optional)
- Pond and Forest Cards (print front and back)
- Game Card (one per team)
- Habitat Hop Spinners
    - 1-5 Habitat Hop Spinner
    - 1-10 Habitat Hop Spinner
    - Paperclip
    - Pencil
- Frog & Toad Images (cut)
- Frog and Toad Nametags (cut)
    - Brown and green construction paper (cut in strips)
    - Stapler
    - Crayons, pencils or markers

Procedure

Teacher Preparation:

- Print the Pond and Forest Cards front and back (2-sided) so that the pond and forest pictures are on the front side and the air, food, water and shelter pictures are on the backside. Cut the cards using the cut lines. Notice that half of them are Pond Cards and half are Forest Cards. Place all the Pond Cards in one area of the classroom with the lily pad pictures facing up. That is your classroom pond. Place all of the Forest Cards in another area with the log pictures facing up. That is your classroom forest.
- Print the Habitat Hop Spinner you would like to use. There are 4 options. One is numbered 1-5 and recommended for kindergarten. One is labeled 1-10 and recommended for first grade. One is blank with 5 spaces. One is blank with 10 spaces. You can use whatever number system you would like on the blank spinners and it's good to challenge your second graders with counting by 2s or 5s. The spinner along with a paperclip and pencil will be used to figure out how many times the students get to hop to reach their habitat cards (picture example).
- Print enough name tags for each student to make one. If you want to have them make headbands, you will also need green and brown construction paper, a stapler and crayons, pencils or markers. Cut the green and brown construction paper into strips to make headbands (picture example).

1. Review with students the definition of a living thing (an organism that has the ability to reproduce, grow, take nutrients for the environment, interact and has an organized structure). Ask students to think about places where they find living things. A home for a living thing is called a habitat.

2. Use the Habitat Hop Intro PowerPoint to discuss:

a. The forest and pond habitats - See what experience and prior knowledge the students have with these habitats. Discuss what living things you might see in each of these places. If students have no prior knowledge, play a short video of each habitat. *A few online video options are listed under video resources below.*
b. Let students know that both of these places are habitats. All living things need a habitat, a place to live and grow where they can get the things they need to survive.
c. Go over the 4 things that all living things need in order to survive in their habitat (air, food, water, shelter/space). Be sure to talk about how animals needs shelter for protection whereas plants need space to grow. Also talk about the difference between animals that have lungs and gills to breathe.
d. Show them pictures of a frog and toad and see if they can identify which is which. Discuss the differences and similarities of frog and toads (more information in background section).
e. Have students determine which habitat is the best home for each animal to get its air, food, water, and shelter.
f. Show them a picture of a Water lily plant and have them discuss which habitat you would find it in. Show them the image of the oak tree and have them discuss which habitat you would find it in. Oak trees also provide leaf litter, mulch, acorns, twigs, and logs on the forest floor. Both of these plants play an important part of their habitats.

3. Let students know that you are going to turn them into Frog teams and Toad teams.

- The Pond and Forest Cards were created for a class of 24 students. This makes enough materials for 6 teams (3 Frog/Pond teams and 3 Toad/Forest teams) of 4 students each.
- If you have less students, make less teams. If you have more students you could print extras to make more teams.

4. Place class into teams of up to 4 students. Then assign half of the teams to the pond habitat (frogs) and half the teams to the forest habitat (toad).

5. Show them the Frog and Toad Images. Review with them which one lives in the pond and which lives in a forest (pond-frog, forest-toad). While the students work on the next step (#6) you can place the images in the classroom habitats for students as a reminder while they play the game.

6. Have teams sit together and make nametag headbands with the Frog & Toad Nametags. Students should write either Frog/Bull Frog or Toad/Southern Toad on their nametag. They can then decorate their headband. Team names are strongly encouraged and could be written on their headband.

7. Staple the headband together to fit each student's head.

8. They are almost ready to play Habitat Hop! Show the students the Game Card and give one to each team. They will use that to keep track of what their frog/toad needs to survive. Each card has an image to represent air, food, water and shelter.

9. Line teams up near their habitat. Place each team in a single file line with the teams surrounding their habitat (pond or forest). Have them place their Game Card on the ground in front of their first teammate.

10. Explain the game – Habitat Hop

a. Working together with their teammates they are going to take turns hopping through their habitats to see if they can collect all the needs of their frog/toad.
b. Using the Pond and Forest Cards already placed on the ground it their classroom, toads will take turns flipping logs in the forest and frogs will flip lily pads in the pond to see if they can uncover their animal's needs (air, food, water, and shelter).
c. The teacher will spin the spinner to see how many jumps each frog/toad gets to take.
d. Once determined, the first frog/toad from each group will hop into their habitat (pond or forest) and turn over one card.
e. If the card is something that their frog/toad needs, they will hop back to their team and place the card in the designated spot on their Game Card.
f. If they turn over something they don't need because they already have it, they should turn the card back over and hop to the back of their team line.
g. Steps c-f will be repeated for the next person on the team until each group has collected air, food, water and shelter for their frog/toad.

Note: For 1st grade students, highlight the plants that are being used. Logs come from trees like oak trees and lily pads come from water lilies. Use the background information for more plant details.

11. Once each team has collected all of their needs, have them share with the class what they found. All of the air cards are the same, but the food, water and shelter cards are different and students can take a closer look at how habitats can provide different food, water and shelters.

12. A couple suggestions if you have a rowdy group:

- Spread the students and cards out so they aren't hopping too close to each other.
- If you have another adult in the room, have one adult be in charge of the Pond Teams and the other adult in charge of the Forest Teams. This will spread the students out a bit more, but also means you need two spinners.
- Have one student at a time hop into each habitat instead of 1 student per team. These will keep the collisions from happening or fighting over the cards.
- Have team players sit down on the ground when not hopping.

Follow-up Questions

- What animal would you choose to be if you could be any animal? What habitat does that animal live in?
- What habitat would you like to see in person that you've never seen before? Why?

At-home Learning and Virtual Modifications

At-home Learning: Send one or both of these nearpod links for students to do at home. Each one will take them from habitat to animal to the needs of living things through an interactive activity.

Habitat Hop – Forest Toads

Habitat Hop – Pond Frogs

If you would like to see the results of their nearpod activities, you can set it up as a Student-Paced activity following these directions.

1. Create a free nearpod account (https://nearpod.com/)
2. Ask Aquarium to send you Forest and Pond student nearpod links (email education@scaquarium.org)
3. After you receive Aquarium links, add lessons to your nearpod activities by clicking "Add to My Library"
4. Send to students using Student-Paced option
5. You'll be able to see their answers and interactions

Virtual: Use the following nearpod information to choose how to teach this activity. Activity will cover the needs of living things in their habitat as well as teach them about a frog and a toad in their habitats; the pond and the forest.

Teacher led lesson without student interaction

Teacher led lesson with student interaction - directions

6. Create a free nearpod account (https://nearpod.com/)
7. Ask Aquarium to send you Habitat Hop nearpod link (email education@scaquarium.org)
8. After you receive Aquarium link, add lesson to your nearpod activities by clicking "Add to My Library"
9. Send to students using Live Participation
10. You'll be able to see their answers and interactions

Assessment

Give each student a Game Card. Have them pick any plant or animal and then draw the air, food, water and shelter/space that animal or plant needs to survive in its habitat.

Scoring rubric out of 100 points

Air	**25 points**
Food	**25 points**
Water	**25 points**
Shelter/Space	**25 points**

Cross-Curricular Extensions

STEM Extension
Give the students this scenario: Pollution (trash and fertilizers) is running into a pond when it rains. Frogs are indicator species, the ones that show distress first if there is a problem with the habitat. Help save the frogs from pollution. Have student groups of 2 or 3 work together to come up with a solution to the problem. They can either choose to design a devise to clean the water or come up with a way to keep the pollution from getting into the pond in the first place. Have them share their solution with the class.

Language Arts Extension
Read a story from Frog & Toad by Arnold Lobel. After showing the Extension Activity PowerPoint. Use hula-hoops to create a Venn diagram and use the Frog and Toad Comparison Cards to compare frogs and toads. Ask students to tell or write an imaginative story about their frog or toad's adventure. 1st grade can highlight plants with the Lily and Oak Tree Comparison Cards from the activity and write an informational text on water lilies or oak trees.

Math Extension
Use the spinners to create math stories based on current math skills. Examples:

- Toad hopped 5 hops and then hopped 3 more hops. How many hops all together? (5+3)
- Frog did 10 hops forward and then 2 hops backwards, How far has frog hopped? (10-2)
- Toad hopped 3 hops 5 times? How many hops has toad done in all? (3x5)
- Frog did 2 hops, 3 hops and 7 hops. How far has frog hopped? (2+3+7)

Resources

Teacher Reference Books
Dorcas, M. & Gibbons, W. *Frogs & Toads of the Southeast,* The University of Georgia Press, Athens, GA. 2008.
An overview of frogs and toads in the Southeast and an in-depth look at identification and information on each species. This book has great range maps, tips for identification/common identification confusions, and color images highlighting each species.

Beane, J., Braswell, A., Mitchell J., Palmer, W., & Harrison, J. *Amphibians & Reptiles,* The University of North Carolina Press, Chapel Hill, NC. 2010.
An overview of amphibians and reptiles in general. Identification guide with color pictures and range maps for species in South Carolina, North Carolina, and Virginia. This book's focus includes snakes, lizards, turtles, salamanders, frogs, and toads.

Porcher, Richard D. *Wildflowers of the Carolina Lowcountry and Lower Pee Dee,* University of South Carolina Press, Columbia, SC, 1995.
Written by a biology professor at the Citadel, this book contains identification information and general information on the ecology and natural history of Lowcountry wildflowers. It contains beautiful photographs.

Videos
YouTube
https://youtu.be/6oSUkCaGV18 - Forest Habitat (2015)
This is a great informational video of the forest as a habitat. It goes over examples of a variety of living things shelter, food and water.

https://youtu.be/VWgyEemLFYU - Bill Nye the Science Guy S02E15 Forest (2016)

This is a funny and educational video goes into detail on the layers of the forest, forest ecosystem, forest floor, human uses of trees, forest fires, and great fun facts. This highlights the tallest trees on Earth in a redwood forests. This video is 22 mins.

https://www.youtube.com/watch?v=n_NTF4JCd8Y – Temperate Deciduous Forest – World Biomes
This describes temperate deciduous forest biome, shows range maps, images of the biome, and animals that you might see in the American deciduous forest. This video is about 3 mins.

https://youtu.be/5qCLRepE9FYY - Freshwater Natural Aquarium: Fish Pond (2013)
This is underwater video clips of a pond highlighting fish with relaxing guitar music. Great to play in the background while students make headbands for the activity. This video is about 5 minutes long.

https://youtu.be/H8EMn_21T4o - Life at the Ponds Edge (2011)
This shows the top view of a pond and has great video clips of frogs and toads and many more animals that live in and around ponds with instrumental music and occasional sounds of the pond. It's about 7 minutes long.

Teacher Reference Websites
http://www.ucmp.berkeley.edu/glossary/gloss5/biome/ - *Berkley*
Information on the world's biomes. You can focus on Forests and Aquatic links to highlight our habitat focus for this activity.

http://kids.nceas.ucsb.edu/biomes/index.html -*National Center for Ecological Analysis and Synthesis (NCEAS)*
Information on biomes including freshwater and temperate forest. This goes through fun facts and animal and plant examples.

https://earthobservatory.nasa.gov/Experiments/Biome/biotemperate.php?src=share - *NASA Earth Observatory*
Information about Temperate Deciduous Forest

http://www.blueplanetbiomes.org/deciduous_forest.htm - *Blue Planet Biomes*
Information about Deciduous Forest from around the world. Information on animals and plants in deciduous forests from around the world.

http://www.dnr.sc.gov/fish/pdf/pondmanagement.pdf - *SC Department of Natural Resources*
This pond management booklet also addresses common animals, plants, and fish that you will see in South Carolina ponds.

http://www.bbc.co.uk/nature/habitats - *BBC*
The world's habitats.

http://environment.nationalgeographic.com/environment/habitats/ - *National Geographic*
Information on habitats around the world.

http://www.worldwildlife.org/habitats
Conserving the habitats of the world.

Plant Website Resources
https://www.wildflower.org/plants/result.php?id_plant=nyod
https://uswildflowers.com/detail.php?SName=Nymphaea%20odorata
Information on water lily for highlighting a pond plant with 1st graders.

https://www.wildflower.org/plants/result.php?id_plant=QUMO4
http://blog.nwf.org/2013/10/the-wildlife-benefits-of-acorns-and-oaks/
Information on Chestnut Oak and oaks in general for highlighting a forest tree with 1st graders. Wildflower.org has great images for showing the flowers and acorn seeds for the Chestnut Oak species.

Student Books
Fleming, Denise. *In the Small, Small Pond*. Henry Holt and Company LLC, New York, 1993.

Messner, Kate. *Over and Under the Pond.* Chronicle Books. 2017.

Franco, Betsy. *Pond Circle*. Margaret K McElderry Books. 2009.

Kopp, Megan. *What Do You Find in a Pond? (Ecosystems Close-Up)*. Crabtree Pub. 2016

Hammersmith, Craig. *Life in a Pond (Habitats around the World).* Capstone Press. 2011

Falwell, Catheryn *Turtle Splash!: Countdown at the Pond.* Greenwillow Books. 2008.

Schwartz, David. *At the Pond.* Creative Teaching Press. 1997.

Lindeen, Carol K. *Life in a Pond (Living in a Biome).* Capstone Press. 2016.

Duke, Shirley. *Seasons of the Freshwater Pond Biome.* Rourke Educational Media. 2013.

Townsend, John. *Pond Food.* HarperCollins Publishers. 2011

Spilsbury, Louise. *Look Inside a Pond.* Capstone Heinemann Library. 2013.

Gould, Jane. *At the Pond: Comparing Numbers.* Shell Education. 2011

Gibbons, Gail. *Tell Me, Tree: All About Trees for Kids.* Little Brown. 2002

Evans, Shira. *In the Forest.* National Geographic Society. 2016.

Boothroyd, Jennifer. *Let's Visit the Deciduous Forest.* Lerner Publications. 2016.

Schaefer, Lola & Schaefer, Adam. *Because of an Acorn.* Chronicle Books LLC. 2016.

Ward, Jennifer. *The Busy Tree.* Two Lions. Dawn Publishing. 2012.

Brenner, Barbara. *One Small Place in a Tree.* HarperCollins. 2011.

Kalman, Bobbie. *A Forest Habitat.* Crabtree Publishing Company. 2006.

Berkes, Marianne. *Over in the Forest: Come and Take a Peek.* Dawn Publications. 2012

Mitton, Tony. *Forest Adventure.* Kingfisher. 2015.

Gershator, Phyllis. *Who's in the Forest?* Barefoot Books. 2016.

Curricula

Project WILD - http://www.projectwild.org/
Project WILD is an interdisciplinary curriculum for K-12 teachers on a broad range of environmental and conservation topics.

Project WET - http://www.projectwet.org
Project WET is an interdisciplinary curriculum for K-12 teachers on a broad range of environmental and conservation topics.

Project Learning Tree - https://www.plt.org
Project Learning Tree is an interdisciplinary curriculum for PreK-8 teachers on a broad range of environmental and conservation topics.