

## Wild Wetlands: K-8th

- Students learn scientific facts about the wildlife of wetlands and make observations of taxidermy, bio-facts, and photos to describe and compare patterns and answer questions about the natural world.
- Students will be able to describe and identify the ecological importance of wetlands.
- Students will learn to describe and identify the challenges and threats wildlife face in their habitats.
- Students learn about what animals need in their habitats and how their specific body parts and behaviors (*adaptations*) help them survive in their habitats.
- Students learn about human impact on the environment and share ideas of how we can have a positive impact and help wildlife.

Grade	NGSS Disciplinary Core Idea	Examples
<b>K</b>	<p><b>LS1.C: Organization for Matter and Energy Flow in Organisms</b> - All animals need food in order to live and grow. They obtain their food from plants or from other animals. (K-LS1-1)</p> <p><b>ESS2.E: Biogeology</b> - Animals can change their environment. (K-ESS2-2)</p> <p><b>ESS3.C: Human Impacts on Earth Systems</b> - Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3-3)</p>	<p><b>LS1.C:</b> <i>Students learn about how wetlands are like a restaurant, a place where many animals come to eat other animals and plants.</i></p> <p><b>ESS2.E:</b> <i>Students learn how beavers can act as ecosystem engineers, making dams that change the area they live in.</i></p>

	<p><b>ESS3.A: Natural Resources</b> - Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)</p>	<p><b>ESS3.C:</b> <i>Students learn that pets should not be released into the wild, and that releasing pets can impact the environment.</i></p> <p><b>ESS3.A:</b> <i>Students learn about the important ecosystem services provided by wetlands and connect their similarities to human resources like restaurants.</i></p>
1st	<p><b>LS1.A: Structure and Function</b> - All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. (1-LS1-1)</p> <p><b>LS1.B: Growth and Development of Organisms</b> - Adult animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-1)</p> <p><b>LS1.D: Information Processing</b> - Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive.</p> <p><b>LS3.A: Inheritance of Traits</b> - Young animals are very much, but not exactly, like their parents. (1-LS3-1).</p>	<p><b>LS1.A:</b> <i>Students learn that grebes have adapted to have large, lobed feet to help them swim.</i></p> <p><b>LS1.B:</b> <i>Students learn that grebes build floating nests on bodies of freshwater to help protect their babies from land predators like raccoons.</i></p> <p><b>LS1.D:</b> <i>Students learn that animals have unique body parts (adaptations) that allow them to survive in certain habitats. For example, bats use echolocation to capture their prey.</i></p> <p><b>LS3.A:</b> <i>Students learn how Leopard Shark babies look just like small adults and are born alive.</i></p>
2nd	<p><b>LS4.D: Biodiversity and Humans</b> - There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)</p> <p><b>LS2.A: Interdependent Relationships in Ecosystems</b> - Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)</p>	<p><b>LS4.D:</b> <i>Students learn about a variety of California's native wildlife that inhabit wetlands like bullfrogs, egrets, pelicans, raccoons, and sharks.</i></p> <p><b>LS2.A:</b> <i>Students learn about how the Anna's Hummingbird helps to pollinate flowers when they feed on the nectar.</i></p>

<p><b>3rd</b></p>	<p><b>LS1.B: Growth and Development of Organisms</b> - Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)</p> <p><b>LS2.C: Ecosystem Dynamics, Functioning, and Resilience</b> - When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (secondary to 3-LS4-4)</p> <p><b>LS2.D: Social Interactions and Group Behavior</b> - Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size. (Note: Moved from K–2.) (3-LS2-1)</p> <p><b>LS3.A: Inheritance of Traits</b> - Many characteristics of organisms are inherited from their parents. (3-LS3-1) Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)</p> <p><b>LS3.B: Variation of Traits</b> - Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1) The environment also affects the traits that an organism develops. (3-LS3-2)</p> <p><b>LS4.B: Natural Selection</b> - Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3-LS4-2)</p> <p><b>LS4.C: Adaptation</b> - For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3)</p> <p><b>LS4.D: Biodiversity and Humans</b> - Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)</p>	<p><b>LS1.B:</b> <i>Students learn about the metamorphosis and life cycle of a bullfrog.</i></p> <p><b>LS2.C:</b> <i>Students learn how invasive species can thrive in locations where habitat degradation is threatening native wildlife. For example, the Red eared Slider has been introduced into California wetlands when unwanted pets are released. They now cause competition pressure on the native Western Pond Turtle.</i></p> <p><b>LS2.D:</b> <i>Students learn how many birds congregate in groups that give them a better chance of surviving predators.</i></p> <p><b>LS3.A:</b> <i>Students learn how frogs begin their lives as tadpoles and metamorphose into frogs.</i></p> <p><b>LS3.B:</b> <i>Students learn how tadpoles can be influenced to metamorphose more quickly if their aquatic habitat is warmer and losing water.</i></p> <p><b>LS4.B:</b> <i>Students learn how birds like grebes use intricate dances to find a mate and some individuals have more success than others.</i></p> <p><b>LS4.C:</b> <i>Students learn how 90% of California's wetlands have been destroyed for human development, harming many of the animals that inhabit them. The Salt Marsh Harvest Mouse is a species that has lost a great deal of habitat and is in decline.</i></p> <p><b>LS4.D:</b> <i>Students learn how pollution impacts the most sensitive creatures of wetlands, like</i></p>
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		<i>amphibians who have permeable skin.</i>
<b>4th</b>	<p><b>LS1.A: Structure and Function</b> - Animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)</p> <p><b>LS1.D: Information Processing</b> - Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions. (4-LS1-2)</p> <p><b>ESS2.E: Biogeology</b> - Living things affect the physical characteristics of their regions. (4-ESS2-2)</p>	<p><b>LS1.A:</b> <i>Students learn about how Little Brown Bats use echolocation to help find their prey and can even differentiate between different species of insect.</i></p> <p><b>LS1.D:</b> <i>Students learn how Turkey Vultures do not just have large nostrils to detect scents better but also an enlarged scent processing part of the brain.</i></p> <p><b>ESS2.E:</b> <i>Students learn how beavers are "ecosystem engineers", altering their environment by building dams and lodges which can create more wetlands.</i></p>
<b>5th</b>	<p><b>PS3.D: Energy in Chemical Processes and Everyday Life</b> - The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (5-PS3-1)</p> <p><b>LS1.C: Organization for Matter and Energy Flow in Organisms</b> - Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1)</p> <p><b>LS2.A: Interdependent Relationships in Ecosystems</b> - Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which</p>	<p><b>PS3.D:</b> <i>Students learn about predator prey relationships in the ecosystem, beginning with creatures that eat plants and ending with apex predators.</i></p> <p><b>LS1.C:</b> <i>Students learn how beavers are warm blooded mammals, keeping warm even in cold waters and eating large amounts of food to keep themselves warm.</i></p> <p><b>LS2.A:</b> <i>Students learn how scavengers like Turkey Vultures play an important role in the ecosystem by removing dead organisms that can cause illness and disease.</i></p> <p><b>LS2.A:</b> <i>Students learn how wetlands are nutrient rich ecosystems full of decomposers</i></p>

	<p>multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)</p> <p><b>ESS3.C: Human Impacts on Earth Systems</b> - Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)</p>	<p><i>that help to keep nutrients cycling between the many creatures that inhabit the wetlands. The introduction of species like the Red-eared Slider can negatively impact the food web.</i></p> <p><b>ESS3.C:</b> <i>Students learn how organisms are impacted by pollution in the waterways and how wetlands can help filter pollutants out of the water to keep the ecosystem healthy. Students learn how human garbage has a large impact on creatures like racoons who often rely on garbage as a food source rather than their natural diet.</i></p>
<p><b>6th-8th</b></p>	<p><b>LS1.B: Growth and Development of Organisms</b> - Animals engage in characteristic behaviors that increase the odds of reproduction. (MS-LS1-4)</p> <p><b>LS2.A: Interdependent Relationships in Ecosystems</b> - Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1)</p> <p>In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction. (MS-LS2-1). Growth of organisms and population increases are limited by access to resources. (MS-LS2-1)</p> <p><b>LS2.B: Cycle of Matter and Energy Transfer in Ecosystems</b> - Food webs demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (MS-LS2-1)</p>	<p><b>LS1.B:</b> <i>Students learn how many birds, like grebes, have intricate mating dances to find their mates.</i></p> <p><b>LS2.A:</b> <i>Students learn how the native Western Pond Turtles can face competition from the invasive Red-eared Slider. This negatively impacts their ability to survive.</i></p> <p><b>LS2.B:</b> <i>Students learn how scavengers like turkey vultures play an important role in the ecosystem by removing dead organisms that can cause illness and disease.</i></p> <p><b>LS2.C:</b> <i>Students learn how wetlands are often very biodiverse habitats where many different creatures can make their homes. Increasing severity of droughts due to the changing climate is disrupting these ecosystems and impacting the creatures who rely on them to survive.</i></p> <p><b>LS4.C:</b> <i>Students learn about the variety of adaptations that California wildlife have</i></p>

	<p><b>LS2.C: Ecosystem Dynamics, Functioning, and Resilience</b> - Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. (MS-LS2-4)</p> <p>Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health. (MS-LS2-4)</p> <p><b>LS4.C: Adaptation</b> - Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common; those that do not become less common. Thus, the distribution of traits in a population changes. (MS-LS1-4)</p> <p><b>ESS3.C: Human Impacts on Earth Systems</b> - Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3)</p>	<p><i>including how frogs have adapted to breathe through their skin to stay underwater longer.</i></p> <p><b>ESS3.C:</b> <i>Students learn about the threats facing various animals that come from human influences as well as the benefits to some animals.</i></p> <p><b>ESS3.C:</b> <i>Students learn how 90% of California's wetlands have been destroyed for human development as well as the efforts to restore that land to its original state.</i></p>
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