Animal Adaptations

- Students learn about how specific animal body parts and behaviors (**adaptations**) help them survive in their specific habitats.
- Students learn facts about California wildlife and make observations using taxidermy, bio-facts, photos, and videos to describe and compare patterns and answer questions about the natural world.
- Students will learn to describe and identify challenges and threats wildlife face in their habitats.
- Students learn about human impact on the environment and learn ideas of how we can have a positive impact and help wildlife.

Grade	NGSS Disciplinary Core Idea	Examples
K*	**LS1.C: Organization for Matter and Energy Flow in Organisms -** All animals need food in order to live and grow. They obtain their food from plants or from other animals. (K-LS1-1) **ESS2.E: Biogeology -** Animals can change their environment. (K-ESS2-2) **ESS3.C: Human Impacts on Earth Systems -** 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) **This program is typically not offered for Kindergarten.*	**LS1.C** *Students are introduced to the relationship between predator and prey.* **ESS1.E** *Students learn how tortoises burrow and alter the environment* **ESS3.C** *Students learn that wild animals should not be taken from the wild and how to respectfully interact with wild animals and care for the environment.*

1st	**LS1.A: Structure and Function** - 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) **LS1.B: Growth and Development of Organisms** - 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) **LS1.D: Information Processing** - 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. **LS3.A: Inheritance of Traits** - Young animals are very much, but not exactly, like their parents. (1- LS3-1).	**LS1.A, LS1.D** *Students learn about a variety of animal adaptations that allow them to survive in certain habitats (e.g. snake tongues for smelling, owl eyes for nocturnal vision).* **LS1.B, LS3.A** *Students learn about Opossum development and growth from birth (developing in a pouch and riding on their mother's back).* **LS1.A** *Students learn about animal defenses to stay safe from predators.*
2nd	**LS4.D: Biodiversity and Humans -** 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)	**LS4.D** *Students learn in depth about three of California's native wildlife (may include opossum, desert tortoise, king snake, rosy boa, and/or spotted owl).*
3rd	**LS1.B: Growth and Development of Organisms** - Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1) **LS2.C: Ecosystem Dynamics, Functioning, and Resilience** - 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) **LS2.D: Social Interactions and Group Behavior** - 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)	**LS1.B** *Students learn about the growth patterns of opossums.* **LS2.C** *Students learn how desert tortoises respond to changing weather.* **LS2.D** *Students learn about the social and solitary aspects of the opossum life cycle.* **LS3.A** *Students learn about the differences between carnivory, omnivory, and herbivory.*

	LS3.A: Inheritance of Traits - 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) **LS4.B: Natural Selection** - Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3-LS4-2) **LS4.C: Adaptation -** For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3) **LS4.D: Biodiversity and Humans -** Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)	**LS3.A, LS4.C** *Students learn about a variety of animal adaptations that allow them to survive in certain habitats (e.g. snake tongues for smelling, owl eyes for nocturnal vision).* **LS4.B** *Students learn about how desert tortoise males use their horns to fight over mates.* **LS4.C** *Students learn in depth about three of California's native wildlife (may include opossums, desert tortoises, king snakes, rosy boas, and spotted owls), their habitats, and the adaptations that help them survive in these habitats.* **LS4.D** *Students learn about human impacts on wildlife and the environment and how to make choices that benefit the environment.*
4th	**LS1.A: Structure and Function -** Animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1) **LS1.D: Information Processing -** 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)	**LS1.A** *Students learn in depth about adaptations for three native California wildlife (e.g. desert tortoise horns used for fighting over mates, opossums playing dead to escape predators).* **LS1.D** *Students learn about the various senses and adaptations opossums use to locate their food at night.* **LS1.D** *Students may learn about owl eyes,*

		ears, and feathers, which help them hunt at night.
5th	**PS3.D: Energy in Chemical Processes and Everyday Life -** 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) **LS1.C: Organization for Matter and Energy Flow in Organisms -** 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) **LS2.A: Interdependent Relationships in Ecosystems -** 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 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) **ESS3.C: Human Impacts on Earth Systems -** 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)	**PS3.D, LS1.C** *Students learn about how different animals eat varied diets to get their nutrients (carnivory, omnivory, and herbivory).* **LS1.C, LS2.A** *Students learn about predator prey relationships in the ecosystem.* **ESS3.C** *Students learn how habitat loss (specifically, human-driven habitat loss) has impacted threatened species (e.g. the spotted owl, the desert tortoise).* **ESS3.C** *Students learn the negative impact of human trash on wildlife.* **ESS3.C** *Students learn how to make choices which help protect the environment and the wildlife living there.*
6th-8th	**LS1.B: Growth and Development of Organisms -** Animals engage in characteristic behaviors that increase the odds of reproduction. (MS-LS1-4) **LS2.A: Interdependent Relationships in Ecosystems** - Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1) 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	**LS1.B** *Students learn that desert tortoises use bony protrusions on their shells (horns) to fight over mates by flipping each other over.* **LS2.A** *Students may learn about the struggle between barred owls and spotted owls, which compete for the same territory and food. (An owl is not guaranteed to be present in any*

	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) **LS2.B: Cycle of Matter and Energy Transfer in Ecosystems -** 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) **LS4.C: Adaptation** - 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) **ESS3.C: Human Impacts on Earth Systems -** 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)	*single program).* **LS2.B** *Students learn about food webs and how something like rat poison can travel through the food web.* **LS4.C** *Students learn about a variety of animal adaptations, including foraging and defense mechanisms in animals such as opossums, snakes, desert tortoises, and owls.* **ESS3.C** *Students learn about the threats facing various animals that come from human influences as well as measures being taken to counter these threats.*