

HIGH SCHOOLS



Riverside Reptiles Education Center

Your NGSS Connection



LS2-Ecosystems: Interaction, Energy, Dynamics

(9-12)

LS2.A/B – Interdependence in Ecosystems/ Cycles of Matter

This program will highlight the natural balance of habitats and the mutual dependency of plant and animal species that sustain it. Living organisms adapt to their biotic environment to survive. Nutrients cycle from the abiotic environment to the biotic world constantly. We have a variety of amphibians, reptiles, and arthropods that can be represented in this class.

Possible topics & animals discussed: symbiotic relationships, predation, competition, disease, population density, food webs, and carrying capacity

- How reptiles and amphibians utilize their environment to thermo-regulate and hydro-regulate
- Burmese pythons rely on leaves and ground cover for camouflage
- Panther chameleons rely on trees as a form of shelter
- Red-footed tortoises rely on plants to meet their dietary needs
- White's tree frogs rely on leaves to deposit their eggs.

LS2.C/D – Ecosystem Dynamics, Functioning and Resilience/Biodiversity and Humans

In this session, we will take a brief look at the disruptions in the physical and biological components of an ecosystem. Students will analyze possible outcomes that may occur due to human activity or that may happen naturally to species in an environment. We have a variety of amphibians and reptiles that can be represented in this class.

Possible topics & animals discussed: biodiversity, population density, resilience, anthropogenic changes, habitat destruction, hunting, poaching, invasive species, urbanization, pollution, and climate change.

- Painted turtle that has been run over by a lawnmower
- You alligator sold in pet trade
- Red eared slider invading waterways in CT and MA
- Burmese python invasion in the FL everglades
- Eastern box turtle, wood turtle, Eastern rat snake, and Copperhead snake are endangered in CT and MA

LS3-Hereditry: Inheritance and Variation of Traits

(9-12)

LS3.A/B – Structure/Function/Inheritance and Variation of Traits

Some animals like the Desert tortoise, have changed very little over the past 200 million years. Others, like Florida's native green lizards, evolved rapidly in just 15 years to adapt to an environmental shift due to the invasive brown lizard. Certain genetic variations give animals a camouflaged appearance to blend in with their environment. For example, the Catalpa Sphinx moth uses its textured wings to blend in with tree bark. This class will discuss the genetic combinations and variations that exist within the world of reptiles and amphibians.

Possible topics & animals discussed: genetic variation, albinism, melanistic, gene mutation, genetic factors, environmental factors, and natural selection.

- Green frog (blue morph; occurs about 1-4%)
- Albino and melanistic red-eared sliders, albino Burmese python and eastern diamondback rattlesnake
- King snake (banded and high yellow morph aka Banana King)
- Geographic variations in poison dart frogs
- The temperature dependence of developmental rates in some reptiles; reversal in some amphibians

LS3-Biological Evolution: Unity and Diversity

(9-12)

LS4.A/B – Evidence of Common Ancestry/Diversity/Natural Selection

We know that environments change over time and natural selection acts on the genetic diversity in species. Individuals with superior traits for the new environment will have more offspring. After many generations in this new environment, the current population may not look like their ancestors because natural selection has changed them – they have evolved – to survive in their new environment.

Possible topics & animals discussed: natural selection, survival rates, genetic variation, gene mutation, genetic factors, inheritance traits, evolution, environmental factors, and population growth

- The distribution of green and gray tree frogs (adaptation through camouflage)
- Rat snake populations in different locales of eastern North America
- European legless lizard evolution
- Differences in gecko species (eyelids and toe pads)
- Python vestigial limbs (ancient limbs from their ancestors)

LS4.C – Adaptations

Natural selection leads to adaptations, which are tied into survival within their habitats. This class will discuss the complex adaptations in reptiles and amphibians including thermoregulation, egg laying, diet, protection, prey catching, and excretion.

Possible topics & animals discussed: anatomical, behavioral, and physiological adaptations, differential survival, extinction, natural selection, survival rates, genetic variation, gene mutation, genetic factors, evolution, inheritable traits, environmental factors, and population growth

- Chameleons use tongue projection, camouflage, prehensile tails, and zygodactyls feet
- Alligator snapping turtles and young copperheads have tongues that resemble worms to lure prey
- Snakes have various ways of catching and subduing prey, including constriction and venom
- Pancake tortoises have physiological advantages to life in the desert
- Mossy frogs use cryptic camouflage to survive in their environment

LS4.D – Biodiversity and Humans

Human activities are causing key changes in biological communities globally. These changes are harming biodiversity and ecosystem function. Ecosystem function is important for sustaining plant and animal communities and ensuring the longevity of human populations. After this session, your students will be able to make predictions about future biodiversity changes.

Possible topics & animals discussed: biodiversity, overpopulation, overexploitation, population density, habitat destruction, hunting, poaching, invasive species, urbanization, pollution, and climate change

- Crocodylians, snakes, turtles shells used globally for textile, food, or ‘medicinal’ purposes
- Rattlesnake round-up
- Red-eared slider and Burmese python invasive species
- Eastern box turtle, wood turtle, Eastern rat snake, and copperhead snakes are endangered in CT and MA
- Wetland species and climate change/pollution/habitat destruction