



GRADE 5



COAST ^{TO} CACTUS

IN SOUTHERN CALIFORNIA

Curriculum and Lesson Plan Resource Guide



theNAT
SAN DIEGO NATURAL HISTORY MUSEUM



Grade 5 Non-Native Species

Essential Question

Why are non-native species bad?

Plants and animals have been transported by humans and introduced into new areas for many centuries. Some of these introductions have been intentional, although a great many have not. Non-native species are species that have been introduced into new areas that have not historically been part of their native range. In contrast, native species are species that have historically occurred as part of an ecosystem in a specific location. Unfortunately, not all species introductions have proven beneficial. Whether intentionally released into the environment, intentionally introduced and then accidentally released, or introduced entirely by accident, exotic species can have substantial negative ecological and economic impacts.



Activity: Non-Native Bullfrog Invasion Game

In this game, students learn how an introduced non-native species of bullfrog affects the native species of frogs.

Materials

- 100-200 pennies (or other small object such as buttons or popsicle sticks to represent food)
- Nametag stickers
- Notebook or paper
- Writing tool

This activity should be done by the entire class together or students working in groups. The activity can be completed before or after a visit to the *Coast to Cactus in Southern California* exhibition. (See Page 2 for activity instructions.)

Non-Native Bullfrog Invasion Game

Key words

Disrupt

To interrupt the normal progress or activity of something.

Ecosystem

All the living things that exist in a particular environment and how they impact one another.

Habitat

The place or type of place where a plant or animal naturally or normally lives or grows.

Invasive species

A species that is not native to a specific location (an introduced species), and which has a tendency to spread to a degree believed to cause damage to the environment.

Before the activity

- Read through the activity instructions.
- Gather materials.

Activity

1. Ask your students: **What is a non-native species?** It can be defined as a species that is introduced into a new area where it previously never lived. Non-native species can include animals and plants. **Have your students seen any non-native plant or animal?** A good example is palm trees. California only has one native palm tree, the California Fan Palm (*Washingtonia filifera*), which grows in desert oasis habitats. Other palm trees planted throughout California are non-native species.
2. Have your students write down what they think happens when a non-native species is introduced into a new area. **What happens to the resources (food, space, mates) available or other plants or animals?** Introducing a non-native species to a new ecosystem can have negative consequences. The species may become an invasive species, which is a species that causes harm to the new environment.
3. Let your student know you will be playing a game to learn what happens when the invasive American Bullfrog gets introduced into an area. The bullfrog was introduced to several states where it was not native. In California, the American Bullfrog is a possible contributor to the decline in the California Red-legged Frog.
4. Have your students or student group gather around a table.
5. Pour out the pennies onto the center of the table.
6. Designate two of the students to be the invasive American Bullfrog. Use nametag stickers to identify the students who are bullfrogs. The rest of the students are native California frogs.

NGSS Alignment for Grade 5

Performance expectation: 5-LS2-1

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models	LS2.A: Interdependent Relationships in Ecosystems	Systems and System Models

Interdisciplinary Common Core Connections: RI.5.7, SL.5.5, MP.2, MP.4



7. Describe the rules to your students. Explain that the pennies represent the frogs' food: flies. Everyone gets a turn to grab the pennies from the table. The bullfrogs are bigger than the California native frogs, so they can eat more flies. The students who are bullfrogs can grab five pennies during their turn. The students who are California native frogs can only grab one penny per turn. Every time the students who are bullfrogs collect 15 pennies, they can select (eat) any of the other students and turn them into a bullfrog.
8. Play the game until all of the pennies are used.
9. Lead a discussion in which students think about and write down answers to guiding questions:

What happened to the food resources (pennies) because of the bullfrogs?

The bullfrogs ate more food and the native species had less food available to them.

What do your students think would happen if the bullfrog population kept growing?

The bullfrogs would put more pressure on the ecosystem and food resources. That could cause the native population to become extinct because of the lack of access to food.

Why do your students think the bullfrog population can keep growing?

Bullfrogs are able to eat more food and reproduce more quickly, and they don't have as many predators trying to eat them.

Key words

Species

A group of animals or plants that are similar and can reproduce with one another; a group of related animals or plants that is smaller than a genus.

Native

Used to refer to the place or type of place where a plant or animal normally or naturally lives.

Predator

An animal that lives by killing and eating other animals; an animal that preys on other animals.

Resource

A place or thing that provides something useful.



Extension

- Have your students design solutions to prevent invasive species of bullfrog from disrupting the ecosystem. Would they introduce more native frogs into the ecosystem, try to trap non-native frogs and move them, or introduce more birds who might eat the non-native frogs?
- Have students research another non-native or invasive species. Local examples of invasive species include possums, Norway rats, feral cats, and European Starling.

What will they learn?

In this activity, students learn the difference between introduced, non-native, and invasive species. Students play a game to model the introduction of an invasive species of bullfrog. Using observation skills, students examine how a non-native species can become invasive. Students focus on limited food resources as the primary cause of disruption to the native species of frog.



Additional Resources

- Visit the *Explore the Region from Coast to Cactus in Southern California* website to learn more about the different habitats in the southern California region. You can find more information at **coasttocactus.sdnhm.org**.
- Check out a specimen from our Nature to You Loan Library. Specimens related to this lesson include: native frogs, salamanders, Brown Rat, Virginia Opossum, and European Starling. For more information visit **sdnat.org/specimenssearch** or contact the Loan Library at **loanprogram@sdnhm.org** or 619.255.0236.
- Visit the San Diego Natural History Museum and explore our *Coast to Cactus in Southern California* exhibition. San Diego is known for its incredibly diverse terrain, ranging from the beaches and chaparral near the coast, to the mountains and the desert farther afield. Using specimens from the Museum's scientific collections alongside immersive environments, hands-on exhibits, live animals, and innovative media, *Coast to Cactus in Southern California* illustrates that richness by taking visitors on a journey through these habitats to explore the plants and animals that live in them.