



The Bio/Diversity Project

Sonoran Desert Biodiversity Outreach Curriculum Fall 2025

Lesson 5: Displaced Species

This lesson has been adapted from: [Invasive Species Game – Lesson Plan](#)

Grade Level: 6th

Time: 50 minutes

AZ Science Standards:

- 6.L2U3.12 Engage in argument from evidence to support a claim about the factors that cause species to change and how humans can impact those factors

Student Facing Learning Objectives:

- I can identify displaced species in the Sonoran Desert.
- I can describe how resources are limiting factors in an ecosystem.
- I can share about the impacts of displaced species on ecosystem health.

Guiding Questions:

- What issues do displaced species cause in an ecosystem?
- What are some displaced species that are threatening our local ecosystem?
- What role do humans play in the distribution and management of displaced species?

Vocabulary:

- Non-native species - species that do not naturally live in a region
- Native species - species that naturally lives in a region
- Displaced vs. Invasive Species - species that are not native to an environment and harm the new environment
 - *While “displaced” places emphasis on the factors that removed the species from its original habitat, “invasive” places erroneous onus on the species itself. For this reason, The Bio/Diversity projects prefers to use the word “displaced”, but acknowledges that “invasive” is terminology students should be familiar with due to its widespread usage in scientific and social spheres.*

Materials:

- [Lesson 5 Powerpoint](#)
- [Lesson 5: Simulation Debrief Worksheet](#)
- Plastic cups
- Plastic knives
- Plastic spoons
- Plastic forks
- Big binder clips
- Red pom-poms
- Black pom-poms
- White pom-poms



Lesson 5: Displaced Species

Mini-Lesson (15 min)

Session Objective: Review previous learning and introduce the new topic. Elicit students' critical thinking so that they may make informed decisions about word choice and impact.

Review with students what we've learned thus far (3 min):

- We've learned a lot about biodiversity in the Sonoran Desert. Let's take some time to quickly review our main learnings:
 - Lesson 1: We created Food Webs where we learned about the interconnectedness of all species in an ecosystem. If one species is removed, all are affected.
 - Lesson 2: We learned about keystone species and created dioramas to show how our keystone species supports diverse forms of life all around it.
 - Lesson 3: We learned about the diverse adaptations of animals and plants of the Sonoran Desert. We got creative and designed our own creatures that are adapted to live in the Sonoran Desert.
 - Lesson 4: We learned about how important insects are to their ecosystems. We participated in station activities where we got to see the diverse mouthparts of different insects and how those mouthparts allow insects to play unique roles in their ecosystems.
- Now that we've explored the richness of biodiversity in the Sonoran Desert, we'll spend our next few lessons focusing on the ways biodiversity is being threatened.

Introduce learning targets, scientist of the week, and displaced species topic (12 min):

- Review the learning objectives. Ask student volunteers to read aloud.
- Present the scientist of the week. Ask a question to engage students with this week's scientist.
- Introduce new terms: native vs. non-native species
 - Native: species that naturally lives in a region (Explain how native species are often referred to as indigenous species, as this can be helpful in remembering the term's definition)



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- Non-native: species that do not naturally live in a region
- Ask students: How do you think non-native species arrive to new environments they're not native to?
- Explain how many of these species are brought to new environments by humans, winds, or currents.
- Tell students that some non-native species are not helpful to an environment, and that there's a word to describe these species: invasive species.
- Ask students if they have heard the term "invasive species" before?
- Tell students that invasive species is a widespread term used by scientists across the world, so it is important students are familiar with the word. However, it might not be the most accurate way to describe these species.
- Explain to students that language and vocabulary can change with time. As scientists gain more knowledge on certain topics, they change their terminology to better reflect what they know.
- Tell students that you will introduce them to a different word to describe "invasive species" and you'd like their feedback on the word.
- Break down both words with students.
 - Ask students what other words the term "invasive" sounds like to them? (ex: invade).
 - Break down the word parts of "displaced" ('dis' is a prefix that means 'away' or 'not', "place" means location, so "displaced" means away from one's place/location).
- Ask students: Based on your understanding of what these species are (i.e. non-native species brought to a new environment by humans, winds, or currents that cause harm to that environment), which terms most accurately describes these species? (Hopefully students choose 'displaced', but if there's disagreement, explain to students how "invasive" implies the species took action to cause harm while "displaced" implies action was done to the species which is now resulting in harm being done.
- Review the slides showing pictures of prominent invasive species in the Sonoran Desert. For each slide, describe:
 - The species name
 - Where it originates from
 - How it got to the Sonoran Desert
 - Its impact on other forms of life in the Sonoran Desert
- Tell students that they are now going to play a game in which they experience the impacts of displaced species on the biodiversity of an ecosystem.



Instructions & Work Time (20 minutes)

Section Objective: Students engage in a simulation game to better understand the impact of displaced species on the biodiversity of an ecosystem.

Explain and Play Displaced Frog Simulation Game (20 min):

- Introduce the Displaced Frog Game to students. Tell students that this game will demonstrate how displaced species create a competition for resources that threaten native species.
- Divide the class into two groups and explain the rules of the game:
 - In each group each student will be assigned a species, and provided with a tool and diet:
 - Lowland Burrowing Treefrog - one plastic spoon, eats only white
 - Western Chorus Frog - two forks, eats white and red
 - Canyon Treefrog - one fork, eats only black
 - Chiricahua Leopard Frog - two knives, eats black and red
 - Bullfrog - binder clip, eats anything
- Tools can only be held in one hand (ex: operating two knives like chopsticks)
- If you are assigned to be the Bullfrog, your goal is to eliminate the other species by choosing what to eat (ex: eating only white pom-poms because that is all that another species can eat)
 - Keep the slides of each frog and their associated tools and diets on the board for the remainder of the game for students to reference
- Assign students a species by counting off numbers, 1-5
 - Introduce each species, its associated number, and its tools and diet
- Have students gather in mixed groups around a table (2-3 groups is recommended per class).
- Randomly distribute pom-poms of all colors onto the table
- Students will have 30 seconds per round to collect food using one hand and their assigned tool
- The native frogs will play three rounds before the displaced frog (Bullfrog) plays.
- Continue with the bullfrog competing for resources for 3-5 more rounds
- Once the game has finished, ask students to count their pom poms
 - Frogs with less than five pom-poms have 'died', and will play as a Bullfrog for the following round
- Repeat the game three times, allowing students to observe the growth of the Bullfrog population and the associated decline of other populations
 - If there are excess pom poms after the first round, remove some of each to ensure that desired effect is reached r.e. elimination of native species due to competition



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- Adjust each round's time as needed to ensure that the Bullfrog provides enough competition
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Wrap-Up (15 minutes)

Section Objective: Students integrate learning from the simulation game by reflecting upon how their species was impacted in the simulation game and the cause of such impact.

Debrief Simulation Game (15 min):

- Distribute the [Lesson 5: Simulation Debrief Worksheet](#). Lead a discussion as a class regarding the previous activity, guiding students to answer questions from the worksheet as you engage in class discussion together.
- Ask students to volunteer responses to the following questions by raising a hand:
 - Were you able to compete with other native species for resources necessary for your survival?
 - Were you able to compete with displaced species for resources necessary to your survival? Why? What made the Bullfrog so successful?
 - What could be the consequences of organisms entering an ecosystem that have a competitive advantage over the native species?
 - What was the effect of the displaced species on the biodiversity of the pond?
 - What can be done to bring the ecosystem back into balance? How can we do so without harming the bullfrogs?