

Lesson 8

Conservation Efforts

Grade Level: 4th-6th

Lesson Length: 120 Minutes

This lesson has been adapted from: [Causes and Consequences of Biodiversity Decline + Conservation Efforts Teacher: Erin Scott](#)

AZ Science Standard:	<p>6.L2U1.13</p> <p>Develop and use models to demonstrate the interdependence of organisms and their environment including biotic and abiotic factors</p> <p>8.L3U3.10</p> <p>Communicate how advancements in technology have furthered the field of genetic research and use evidence to support an argument about the positive and negative effects of genetic research on human lives</p>
Learning Objective:	<p>Students will be able to create and communicate at least one solution to a conservation issue regarding loss of biodiversity.</p>

Scientist of the Week:



Cristian Román-Palacios



- Data Scientist & Biologist
- University of Arizona in Tucson, AZ
- Cristian Román-Palacios is a biologist with expertise in phylogenetics, biostatistics, and machine learning (a branch of artificial intelligence (AI) and computer science). He has published more than 25 papers on a variety of topics. His research has been featured in Science news, Popular Science, CNN, USA Today, among many other news outlets. Cristian primarily studies large-scale biodiversity patterns from an ecological/evolutionary perspective and examines the effects of climate change on species survival.

Vocabulary

Materials

<ul style="list-style-type: none"> • Conservation • Biodiversity • Climate Change 	<ul style="list-style-type: none"> • Causes and Consequences of Biodiversity Decline + Conservation Efforts • Desert Animals - Match and Color (Half of a class set) • Colored pencils (class set) • Ipad or Chromebook • Paper Plates (class set) • Rolls of Tape (half class set) • Scissors (class set)
<p style="text-align: center;">Guiding Questions</p> <ul style="list-style-type: none"> • What is the effect of climate change on biodiversity decline? • What are the costs of biodiversity loss? • What groups of people does the loss of biodiversity affect first? What groups are affected the most and why? 	

Engagement Activity(10 minutes)::

- As a class, investigate the [Climate Time Machine](#)
- Have students write down observations from the changes seen in Arizona and globally
- As a class, discuss any findings related to biodiversity loss. Proceed to watch the following video, encouraging students to take notes throughout it: [Endangered Species | Environment & Ecology](#)
4 mins

Exploratory Activity (minutes):

Sustainability City Activity(30 minutes)

- Tell students that we will be working on designing a city where they make choices about transportation, energy, spaces, and waste management and learn about sustainability through that.

Objective:

Design a city that maximizes conservation and minimizes environmental impact by making choices about transportation, energy, green spaces, and waste management. Points are awarded based on the climate impact and sustainability of each choice.

Materials:

- City Planning Worksheet (for tracking choices and point totals)
- Reference Guide with point values for each option

Setup: Each student or group starts with 100 points and aims to create the most sustainable city possible. They'll make selections in four key areas: Energy, Transportation, Green Spaces, and Waste Management. Each choice has a point cost or reward, incentivizing low-impact and sustainable options.

Extension Activity (15 mins):

- After planning their cities, the students will plot their sustainability points vs each step to see how their choices impacted the sustainability of their cities.
 - We will create an example of the activity completed including the graph to serve as guide for the students
- Next, the students will inspect their graphs and find areas (energy, transportation, green spaces, waste management) where their sustainability points decreased. They will come up with rules or actions their residents must take to be more environmentally conscious.
 - Examples: reduce excessive water/energy use , install solar panels, walk as mode of transportation, etc.
- After coming up with rules, students will share their rules / actions for their residents

Diorama Activity(30 minutes)

- Hand out materials to each table group. Each student should have:
 - 1 Paper Plate
 - 1 Pair of scissors
 - Tape
 - Coloring supplies
- Explain that the goal this activity is to create the ideal environment in a diorama for the Sonoran Desert animal of their choice
- Explain that biodiversity loss occurs when there is less different types of species than normal in an environment
- In their environment drawing they should include:

- Different animals
- Plants
- Food sources
- Water sources
- Shelter for the animal to thrive
- Students should choose an animal from the cutout page to focus on, cut it out, fold it to have a base, cut out their paper plate and fold it, and glue the animal standing up on the paper plate after they are done drawing in the environment on the paper plate.
- After folding the plates, they should be concave up to have two sides

Explain Activity(10 minutes):

- Encourage students to take a look at their dioramas and ask themselves
 - “What would happen if they removed one factor that was originally included (other animals, food, water, plants)?”
 - “What would happen if two or more of those factors were removed?”
- Explain that removing factors is what happens when biodiversity declines and is what environmentalists seek to learn more about through research and conservation/restoration plans.
- Share that the reason that we created dioramas is that art and communication about things happening in the environment is just as important as research because the public needs to know about environmental issues in order to create solutions to those problems.

Extension Activity(10 minutes):

- go over how climate change is predicted to affect the Sonoran Desert [as a class: Climate Change in the Sonoran Desert \(U.S. National Park Service\)](#)
 - The Sonoran Desert is expected to become hotter and drier.
 - These changes are likely to have strong impacts on the abundance and distribution of the region's plant species.
 - Species without drought-survival mechanisms may decrease or experience high mortality.
- Have the students create the second side of the diorama based on the following prompt
 - How would your animal and its environment be affected if in twenty years from now there are higher temperatures of 125° during the summer and only one inch of rainfall?

- Encourage students to research using available technology

Evaluation Activity(10 minutes):

- With their elbow partners, have students choose one of the animals that they based their dioramas on.
- Students will then research to create a conservation plan regarding that animal or its specific environment.
- Encourage creative freedom in their conservation plan.

Alternative Evaluation Activity:

Reflection (5mins):

1. What is the effect of climate change on biodiversity decline?
2. What can we do to be more sustainable?
3. What was fun about the activity?
4. What was challenging?

Modified from the UA Community and School Garden's Green Academy Lesson Plan Template