



Welcome to the Activity Guide for BACK FROM THE BRINK: SAVED FROM EXTINCTION. This extraordinary film explores the true stories of

animals rescued from the brink of extinction!

Use this guide as your own nature science journal to help you connect with animals in your own backyard! Explore through hands-on science activities and learn about your own local BACK FROM THE BRINK: SAVED FROM EXTINCTION success stories. Although the Channel Island Fox, Christmas Island Red Crabs, and the Golden Monkey live in remote places on the planet, you can find similar stories nearby. Let your sense of wonder take over, as you discover the inspiring natural world that surrounds you!

We also need your help to protect our environment and save endangered species! Make the Back from the Brink Promise at www.backfromthebrink.com and commit to connecting with nature. By making the promise you will receive a certificate that recognizes your commitment and provides you with resources and event opportunities!

Remember to always seek adult permission and supervision before you venture outdoors and always give animals space when you see them. Never approach a wild animal.

FOR TEACHERS:

Utilize our science lessons and activities to take your students on an extraordinary trip around the planet and learn about three wildlife conservation success stories - bringing wildlife BACK FROM THE BRINK: SAVED FROM EXTINCTION. The following STEM extension activities bring real-world relevance to the concepts of environmental science, biodiversity, ecosystem health, and many other "Main Ideas" and "Key Terms".

Book a field trip to your local museum with a giant screen theater to give your students an in-depth perspective on species conservation, scientific practices and see why "we protect what we love."

While the individual activities were designed to connect children to the nature that surrounds them, in meaningful ways, the Extension Activities were created to be done in collaborative work groups, or in rotating stations. Each activity may also be adapted to suit your entire class. These activities will engage your students through explorations in science and the natural world, using real-word examples, while encouraging them to think on their own.

The immersive activities will enhance your students' understanding of issues endangered species face, and some innovative ways we humans have intervened to help.

*Grade levels suggested are general guidelines. Teachers may adapt lessons for their students' needs and interests.

ACTIVITIES OVERVIEW

PART 1: CALIFORNIA'S CHANNEL ISLAND FOX

- ➤ NATURE JOURNAL OBSERVATIONS
- > EXTENSION ACTIVITIES
 - THE IMPORTANCE OF KEYSTONE SPECIES
 - CHANNEL ISLANDS FOOD WEB ACTIVITY
 - CHANNEL ISLANDS ECO-TWISTER GAME





PART 2: CHRISTMAS ISLAND RED CRABS

- ➤ BACKYARD PLOT STUDY NATURE SURVEY
- ➤ EXTENSION ACTIVITY
 - BUILD A WILDLIFE BRIDGE! 3-D PROTOTYPE ANIMAL CROSSINGS

PART 3: THE GOLDEN MONKEY

- ➤ BACK FROM THE BRINK: IN YOUR OWN BACKYARD!
- ➤ EXTENSION ACTIVITIES
 - UMBRELLA SPECIES GAME
 - ILLUSTRATING AN UMBRELLA SPECIES



PART 4: EARN YOUR CONSERVATIONIST CERTIFICATE!

➤ YOU CAN MAKE A DIFFERENCE! #MyNaturePromise

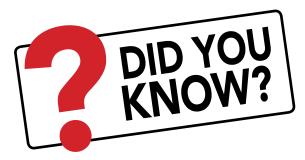
PART 1:

CALIFORNIA'S CHANNEL ISLAND FOX

66 Anything else you're interested in is not going to happen if you can't breathe the air or drink the water.

Don't sit this one out. Do something. ??

— Carl Sagan



Channel Island foxes are so important to the Islands' ecosystem they are considered a keystone species. If the foxes disappear, the entire island ecosystem would collapse!

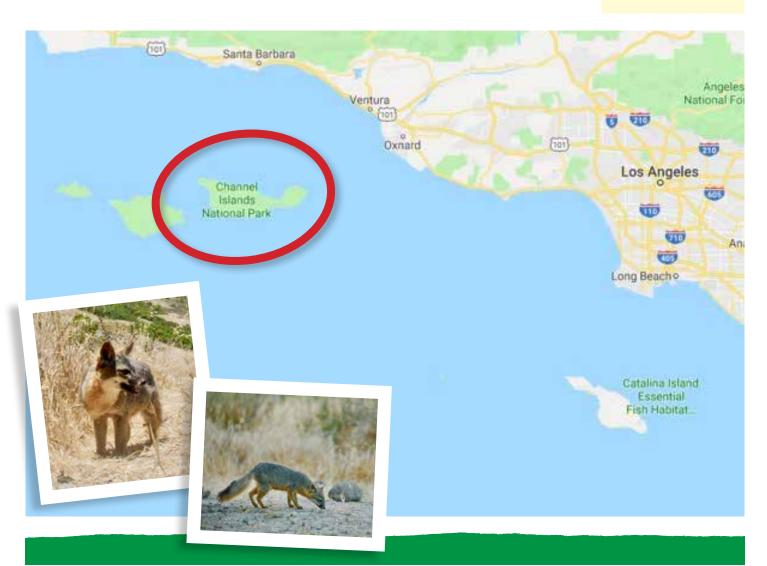


MAIN IDEAS

Keystone Species
Human Impacts
Wildlife Management
Extinction
Conservation

KEY TERMS

Ecosystem
Food Web
Conservation
Endangered Species
Pollution



PART 1: CALIFORNIA'S CHANNEL ISLAND FOX NATURE JOURNAL OBSERVATIONS



You don't have to travel to the Channel Islands to find foxes, eagles, and mice! Nature is all around us! You might live in a city, a neighborhood, or in the country, but if you look around you are sure to see animals and plants. We share our homes and neighborhoods with all sorts of living things! Spending time with the natural world allows us to get to know nature, and the place we live. You might find wildlife similar to what we saw on the Channel Islands. Make your observations in the same way the Channel Islands scientists did-make sure to investigate the land, water, and sky!

MATERIALS

Printout of this activity Pencil Timer (clock or phone timer)

PROCEDURE

- 1. Find a space in your backyard, a nearby park, or another safe place to sit and observe nature. This will be your own nature niche! Bring an adult with you to make sure you select a safe space. If you are unable to venture outside, find a quiet place by a window and create a nature niche there.
- 2. Look around your Nature Niche and make sure it is safe. Sit quietly.
- 3. Draw a map of your Nature Niche. Draw yourself in the center of the square below. Now draw what you see around you. Refrain from looking at your phone or electronics for this time. Do you see trees, buildings, rocks, or something else? Do you see any wildlife?



PART 1: NATURE JOURNAL OBSERVATIONS (continued from page 5)

4.	Close your eyes and listen to your surroundings		BACKFROM	
5.	What do you hear?		SAVED FROM EXTINCTION	
6.	What direction is the sound coming from?			
7.	What do you think is making those sounds?			
8.	Did you already draw it in your map?			
9.	Add the things that you heard into the map you drew. If you can't see what is making the noises, imagin what they look like, and how far they are from you. Draw them on your map, or outside the edges.			
10.	Now add anything that you might smell around Something that smells good or something that s		you smell flowers?	
11.	List all of the things that you observe around yo anything else you see, hear, or smell. Are they live			
	LIVING	NON-LIVING		
	Do you see any animals around you? What are crawling, or are they doing something else? I	re they doing? Are they searching fo Describe the animals you see and th	or food, eating, flying, nat they are doing.	
	2. After completing the activity, do you feel mo If yes, in what ways? Did you notice somethin		?	

Come back to your *Nature Niche* whenever you are able to! Repeat the procedure in the winter, spring, summer and fall to see how your space has changed! You never know, you might find a little fox, or see an eagle above!

PART 1: CALIFORNIA'S CHANNEL ISLAND FOX

EXTENSION ACTIVITY: THE IMPORTANCE OF KEYSTONE SPECIES



FOR TEACHERS:

Can be adapted for grades 3-8

PROCEDURE

PART 1: In a whole-class setting

- 1. List the Main Ideas and Key Terms on the board or smart board and define each term with the class, referencing the film.
- 2. Illustrate the basic concept of a food web; draw a simple food web and label producers, primary, secondary and tertiary consumers, and decomposers.
- 3. Ask students to complete Section 1 of the Channel Island food web activity on page 8 of the guide. Allow time for them to complete Section 1 and review their answers.

PART 2: in collaborative work groups

- 1. Create collaborative work-group teams of 3-4 students.
- 2. On the board, illustrate a simple rounded archway made of stones.
- 3. Draw and label the keystone. Explain that the arch will collapse if the keystone is removed.
- 4. Next, ask students to complete Section 2 on page 8. Finally, as a class, discuss each organism's role in the ecosystem.
- 5. Prompt students to discuss what might happen it a keystone is removed, within their small groups and share out to the class.
- 6. Identify some examples of keystone species. Are they typically herbivores, carnivores, or omnivores? Are they a predator or prey?
- 7. Ask students to discuss what would happen to an ecosystem if the keystone species were removed. How does this relate to what happened on the Channel Islands?

Channel Island Fox Food Web Birds Lizards **Deer Mice** Eggs **Insects Fruit Bacteria**

KEYSTONE

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MATERIALS

Printouts of this activity Class set of pencils Dry-erase board,

smart board, or easel pad

Markers

marshmallows (optional)

NGSS

5-LS2-1 Ecosystems: Interactions, Energy, and Dynamics

Develop a model to describe the movement of matter among plants, animals, decomposers,

K.ETS1.A (3-LS4-4)

1.LS1.B (3-LS2-1)

2.LS2.A (3-LS4-3),(3-LS4-4)

2.LS4.D (3-LS4-3),(3-LS4-4)

4.ESS3.B (3-LS4-4)

4.ETS1.A (3-LS4-4)

(3-LS4-1), (3-LS4-3), (3-LS4-4)

MS.LS2.C (3-LS4-4)

MS.LS4.A (3-LS4-1)

MS.LS4.B (3-LS4-3)

MS.LS4.C (3-LS4-3), (3-LS4-4)

(3 -LS4-3),(3-LS4-4)

MS.ESS2.B (3-LS4-1)

Additional Extensions:

Create 3D Roman arches! Divide students into collaborate work groups. Provide each group with marshmallows and scissors. Instruct the students to cut the marshmallows in the shape of the arch you illustrated. Build an arch to match the illustration. What happens when they remove the keystone? Once they are finished and demonstrate that they can build an arch, they can eat their projects!

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Critical thinking! Ask students to illustrate a simple food web which includes themselves.

and the environment.

K.ESS3.A (3-LS4-3), (3-LS4-4)

4.ESS1.C (3-LS4-1)

MS.LS2.A (3-LS2-1),

MS.ESS1.C (3-LS4-1),

MS.ESS3.C (3-LS4-4)

PART 1: CALIFORNIA'S CHANNEL ISLAND FOX

EXTENSION ACTIVITY: CHANNEL ISLANDS FOOD WEB ACTIVITY



SECTION 1: MATCHING ECOSYSTEM ROLES

Write the organism next to the correct ecosystem role.

1.	Producer:	ORGANISMS
2.	Primary Consumer:	Channel Island Fox
3.	Secondary Consumer:	Deer Mice
4.	Secondary Consumer:	Birds
		Fruiting plants Bacteria
5.	Secondary Consumer:	Insects
6.	Tertiary Consumer:	Lizards
7.	Decomposer:	Lizards
SE	CTION 2: FOOD WEB DIAGRAM	
Dra Cir	aw the Channel Islands food web in the space below, using the listed organisms. rcle the keystone species.	

PART 1: CALIFORNIA'S CHANNEL ISLAND FOX

EXTENSION ACTIVITY: CHANNEL ISLANDS ECO-TWISTER GAME

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FOR TEACHERS:

Can be adapted for grades 3-8

Students take part in our ecosystem survival game focused on the Channel Islands! Students will learn how living things are interconnected with their environment and how drastic changes affect the future survival of Earth's species.

This activity works best with less than 10 students and is best used as a station activity-alternating collaborative work groups between simultaneous activities in the classroom.

PROCEDURE

STEP 1: Identify what animals need to survive.

- 1. Ask the students if they know what every living thing needs.
 - Use inquiry methods. Provide clues if needed. The first two that are usually given are food and water. When the students answer those, place

the corresponding Eco-Twister tear-out on the wall or white board.

2. They should also answer for shelter and space. You may also take out each Eco-Twister tear-out and hold it up so they can all read it aloud together. Explain that these resources collectively make up a habitat.

STEP 2: Playing the game - Round One

3. Take out the Twister™ mat and put it down on the floor. Tear-out and place the Eco-Twister Color Code Page on the board.

Note: You may make your own mat with a plastic table cloth. You can paint the colored dots on. You may also place colored duct tape on the floor to make your dots.

- 4. Inform students that as they can see there are four colors of dots on the mat and each represents a resource that makes up a habitat. Red is food; blue is water; yellow is shelter; green is space.
- 5. If you have more than 20 in the group divide them into two groups.
- 6. Ask the group to stand around the Twister[™] mat. Explain that they are all Channel Island Foxes. Where would they live? What they would eat? How would they find water and shelter?
- 7. Read these instructions to students: "You are going to put your feet and hands on the correct resources (colors) when I call them out. First, our foxes are moving into an ecosystem and they want to find some food. Place your right foot on food." (If you have too many participants, they will not find food).

Allow them to share the spaces with other animals just for the first round. Animals cannot share forever and eventually sharing leads to competition.

Instruct them to put their other foot on water (you don't have to go in this order) while keeping their first foot on food. Then have them put one hand on shelter then space. At the end tell them to all stand up and go back to their chairs. Make sure everyone noticed that all the animals survived and everyone made it through the round.

MATERIALS

Printouts from this activity

Eco-Twister Tear-outs

Eco-Twister Impacts Cards

Eco-Twister Color Code Page

Twister™ mat (or make your own)

NGSS

5-LS2-1 Ecosystems: Interactions, Energy, and Dynamics

Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

K.ESS3.A (3-LS4-3), (3-LS4-4)

K.ETS1.A (3-LS4-4)

1.LS1.B (3-LS2-1)

2.LS2.A (3-LS4- 3), (3-LS4-4)

2.LS4.D (3-LS4-3),(3-LS4-4)

4.ESS1.C (3-LS4-1)

4.ESS3.B (3-LS4-4)

4.ETS1.A (3-LS4-4)

MS.LS2.A (3-LS2-1), (3-LS4-1),(3-LS4-3),

(3-LS4-4) **MS.LS2.C** (3-LS4-4)

MS.LS4.A (3-LS4-1)

MS.LS4.B (3-LS4-3)

MS.LS4.C (3-LS4-3),

(3-LS4-4)

MS.ESS1.C (3-LS4-1), (3 -LS4-3),(3-LS4-4)

MS.ESS2.B (3-LS4-1)

MS.ESS3.C (3-LS4-4)

STEP 3: Round Two

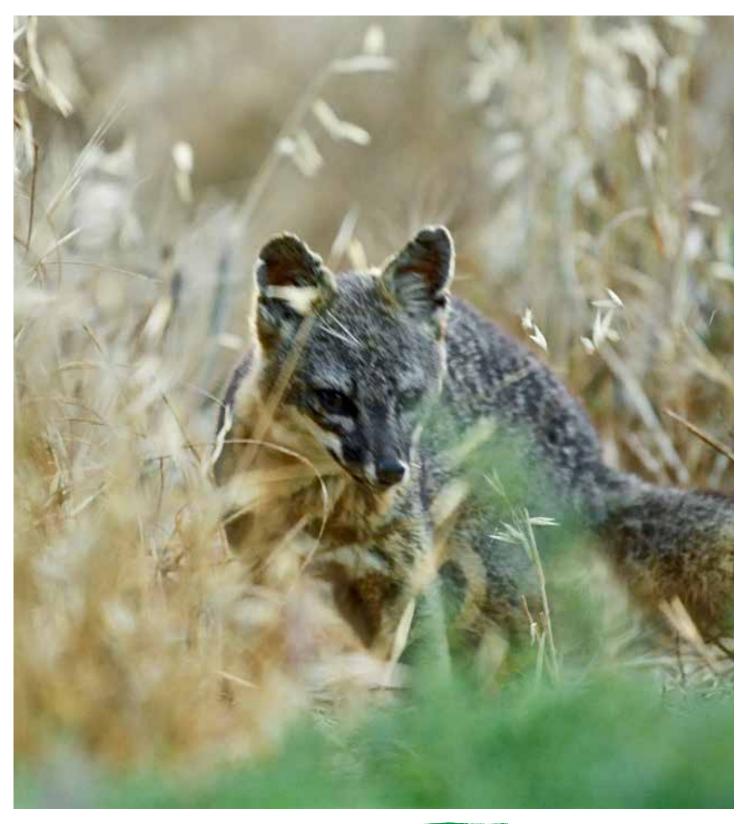


8. Instruct the students that animals cannot share anymore. In fact, if two animals fight or go after the same space BOTH will die. If you are an animal that cannot find a space, unfortunately you will not survive.

- 9. Before you start this round, show the group the Impacts Cards and ask them to identify some bad things that can happen to an ecosystem. Refer back to the film and mention DDT, invasive species (golden eagles), cars, human houses, etc.. As you discuss these concepts, cover up enough Twister mat spaces so that 2 or 3 animals cannot access them.
- 10. Play the round as before and recognize how and why each animal is eliminated. Ensure that everyone understands that the impacted ecosystem is harder to live in than the first one.
- 11. After each round, take away more and more spaces so increasing numbers of animals do not make it through the round.

STEP 4: Review Concepts12. Review the key concepts when the game is over. Allow students to discuss what happened to them. How were they eliminated? What does this mean for the Channel Island Fox? How do the impacts affect what it eats, how it finds water, shelter, and space?

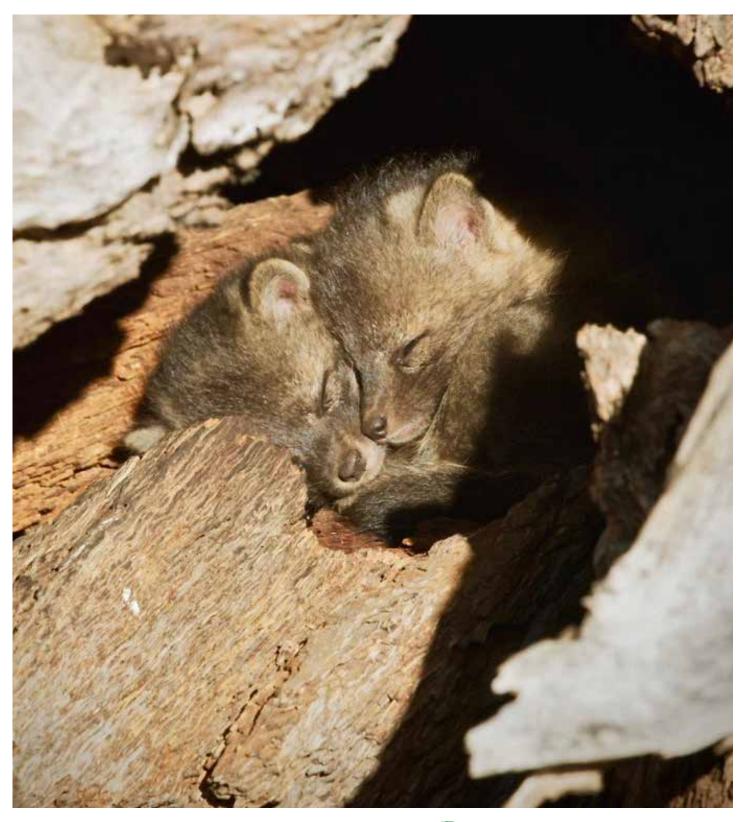
















Eco-Twister Impacts Cards





Eco-Twister Color Code Cards



FOOD FOOD FOOD FOOD

WATER WATER WATER

SHELTER SHELTER SHELTER SHELTER SHELTER SPACE SPACE SPACE SPACE

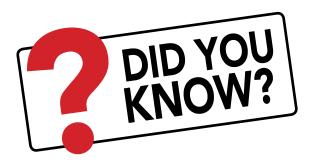
PART 2:

CHRISTMAS ISLAND RED CRABS



66 The greatest threat to our planet is the belief that someone else will save it. **99**

— Robert Swan



Before the introduction of the Yellow Crazy Ant, there were about 40 million red crabs on Christmas Island!

MAIN IDEAS

Biodiversity Biological surveys The Scientific Method

KEY TERMS

Species Native Species Invasive Exotic Species Biocontrol



PART 2: CHRISTMAS ISLAND RED CRABS BACKYARD PLOT STUDY NATURE SURVEY



Create your own backyard version of the plot study scientists used to count how many Yellow Crazy Ants were in the environment of Christmas Island.

In the last activity you surveyed a large area and observed its sights, sounds, and smells. Plot studies help us focus on the little details and help scientists find and count the types of plants and animals in an area.

PROCEDURE

Let's use the scientific method to find a better understanding of nature in your backyard!

STEP 1: Ask a question.	
What do you think you will find in your backyard	d plot?

MATERIALS

Printout of this activity Pencil Measuring tape or ruler String Scissors

Magnifying glass (optional)

Field guide (optional)

STEP 2: Gather Information.
Research nature in your area using books or the internet. List four types of bugs that can be found in your area.
STEP 3: Form a hypothesis.
In science, a hypothesis is an idea or explanation that you then test through study and experimentation. What do you think you will find in your backyard?

STEP 4: Test your Hypothesis.



1. Find a safe outdoor spot to work in your own backyard, at a park, or at your school. Make sure you have adult permission before you start your study.

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- 2. Use a measuring tape or a ruler to measure enough string to outline one square foot, or four feet of string.
- 3. Use scissors to cut the string to the correct length.
- 4. Create your plot; Lay the string on the ground, and shape it into a square, with 4 even sides. ➤
- 5. Draw your plot below.



6. Make a list of all of the things you see in your plot.

T	EP 5: Analyze your results.	POINK		
•	Did you find anything that you listed in your hypothesis?	VED FROM EXTINCTION		
	Now choose your favorite thing from the list.			
	Is it living or non-living?			
	Does it move? If yes, how does it move about?			
3.	Draw a picture of your favorite thing from your list.			
ŀ.	Why did you choose this as your favorite thing?			
т	EP 6: Draw Conclusions.			
	What did you learn about your backyard? How was your study similar to what scientists f on Christmas Island?	ound		

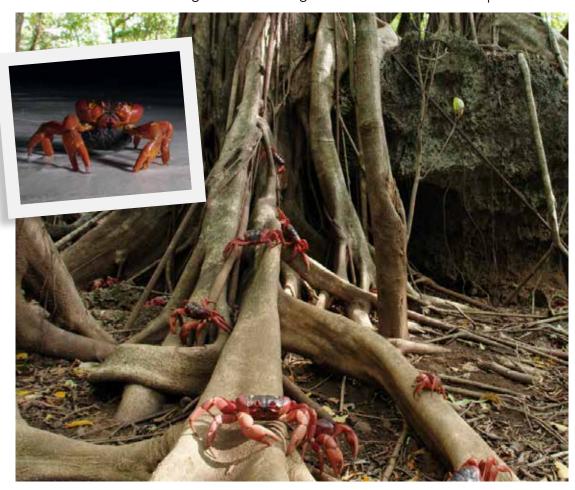
PART 2: CHRISTMAS ISLAND RED CRABS

EXTENSION ACTIVITY: BUILD A BRIDGE! 3-D PROTOTYPE WILDLIFE CROSSINGS



FOR TEACHERS: Grades 5-8

Christmas Island Red Crabs must cross highways to make it to the ocean to complete their life-cycle. Thousands of crabs don't survive the crossing. In this activity, students will have to think like ecologists and civil engineers in order to solve the problem.



MATERIALS

Printouts of this activity
Protractors
Rulers
Craft sticks
Cardboard sheets
Twine
Masking tape
Scissors

NGSS

MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing human impact on the environment

MS-ETS1-4: Engineering v Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

HS-LS2-7: Ecosystems: Interactions, Energy, and Dynamics Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

PROCEDURE

1. Create collaborative work-group teams of 3-4 students.

STEP 1: Introduction

2. Describe the following scenario to your class:

"As more roads are built, cutting across animal habitats, people are finding innovative ways to keep animals safe. Ecologists identify the problem to be solved and engineers help solve them by designing wildlife crossing bridges. Design your own wildlife crossing to enable Christmas Island Red Crabs to make it safely across the road on their migrations to the ocean. It is your job to design and build a wildlife crossing either over or under an imaginary tabletop, using the materials provided."

STEP 2: Design blueprints

3. Give each group protractors to measure the angles and rulers to measure the size of each part of their structure. Instruct students on how to design their own engineering blueprints! Demonstrate on the board, how they should draw their lines, and label the dimensions (length, width, height) and angles



STEP 3: Build the bridge

4. Give each group their own set of materials and instruct them to engineer and construct a 3-D prototype of a bridge which would enable the crabs to safely cross over or under the hypothetical road. They should build their bridges on the table tops, using only the provided materials.



STEP 4: Sharing and testing

- 5. Ask each group to describe their bridge, why they designed and built it as they did, and how it functions for wildlife crossing.
- 6. Create a competition- stack light objects of equal weight on the bridges to see whose was built the strongest!

Additional Extensions: Additional math can be incorporated by adding a monetary value to each material and instructing students to calculate the cost of their structure. Ask students to research real-world wildlife crossing success stories.

PART 3: THE GOLDEN MONKEY

BRINK SAVED FROM EXTINCTION

MAIN IDEAS

Umbrella Species Ecotourism Compassion

KEY TERMS

Habitat Wildlife Preserve

66 We only protect what we love, we only love what we understand, and we only understand what we are taught. ??

— Jacques Cousteau

DID YOU KNOW?

Golden monkeys can tolerate colder temperatures than any other monkey species!



PART 3: THE GOLDEN MONKEY

BACK FROM THE BRINK—IN YOUR OWN BACKYARD!



Visit a local nature preserve and explore a Back From The Brink success story in your area. A great place to start is with The Nature Conservancy! Visit www.nature.org/mybackyard to connect with a local conservation issue. Learn about your hometown eco-heroes and find out how you can get involved!

Where in the world are you?						
	find what amazing work is being done by The Nature Conservancy in your own ea, complete each statement	MATERIALS				
		Printout of this activity				
	I live on the continent called	Pencil				
2 is the country I		Internet access				
3.	I live in the state, commonwealth, or province of					
4.	is my city!					
Us	Using your answers above, visit www.nature.org/mybackyard to learn about your own conservation stories!					
5.	List the conservation work being done in your area:					
6.	Draw a picture of an animal or plant that lives in your area, and needs protecting:					
<u>_</u>						
7.	What could you do to help save this species?					

PART 3: THE GOLDEN MONKEY

EXTENSION ACTIVITY: UMBRELLA SPECIES GAME



FOR TEACHERS: Grades 3-8

The Golden Monkey is an example of an umbrella species. By protecting the habitat of an umbrella species, we indirectly protect all the wildlife that lives in the area.

-All the species that live there fall under their umbrella of protection.



MATERIALS

Umbrella Baseball cap

NGSS

MS-LS2-3 Ecosystems: Interactions, Energy, and Dynamics

Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

PROCEDURE

Ask your class, "How do you think that protecting the Golden Monkey might help protect other species that live in the same habitat?"

After students share their responses, explain to them that the protection of one species actually protects many; we call that species an umbrella species.

- 1. Ask one student to volunteer to hold an umbrella.
 - Ask a few other students to come stand under the umbrella.
- 2. Ask another student to come up and put on a baseball cap
- 3. Now ask a few students to come up and see how many students will be protected by the baseball hat.
- 4. Lead a classroom discussion on which one provides more protection from the rain.
- 5. Ask:
 - How does this relate to the Golden Monkey?
 - What are some other animals that qualify as umbrella species?
- 6. Have students draw their own umbrella species diagram on the next page, **EXTENSION ACTIVITY: ILLUSTRATING AN UMBRELLA SPECIES.**

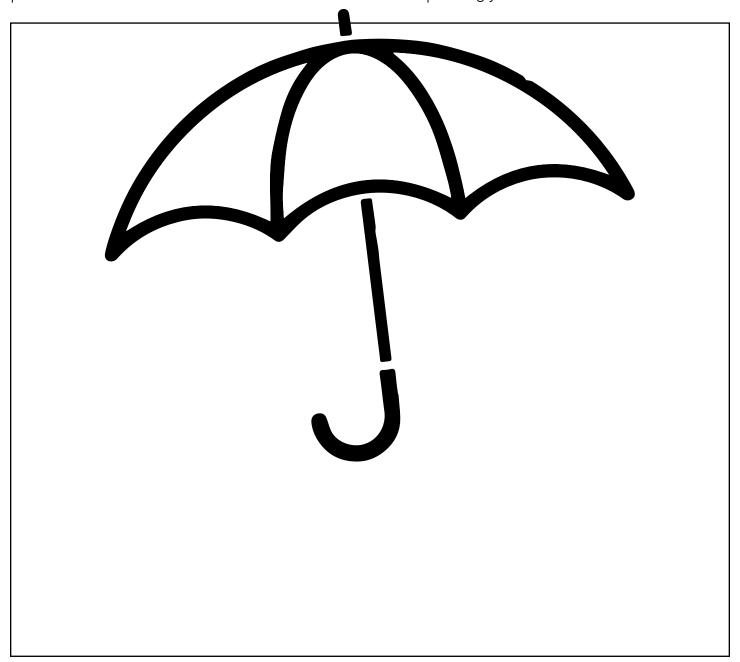
PART 3: THE GOLDEN MONKEY

EXTENSION ACTIVITY: ILLUSTRATING AN UMBRELLA SPECIES



Protecting the Golden Monkey also protects all of the other animals that share its home! If we create a nature preserve for one animal, we actually protect all the living things that share the same habitat. The species which is protected is called an umbrella species, because its protection is like an umbrella that protects all that live nearby.

Draw your own diagram of an umbrella species inside the umbrella below! Think of one wild animal which we protect, and draw it inside the umbrella. Next draw all of the other animals that share the same home and are protected under this umbrella. Make sure to ask an adult for help finding your answers!



YOU CAN MAKE A DIFFERENCE!



66 It's the little things that citizens do. That's what will make the difference. My little thing is planting trees. ??

— Wangari Maathai

PART 4: EARN YOUR CONSERVATIONIST CERTIFICATE! YOU CAN MAKE A DIFFERENCE!

Circle the activities that you and your family already do!

Draw a **rectangle** around the activities that you and your family would like to begin to do.



Ride your bike instead of taking a car



Take shorter showersfive minutes or less



Turn off the water faucet while scrubbing dishes



Turn off the lights when you leave the room



Use both sides of paper



Eat more fruits and veggies!



Use scrap paper



Recycle!



REFUSE single-use plastics!



Visit your local nature preserve

You are ready to earn your Conservationist Certificate from The Nature Conservancy! Visit www.backfromthebrink.com to make the promise and learn about more ways to connect with nature.





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Activity Guide Development and Writing:

David Webb, Museum of Discovery and Science AutoNation IMAX Theater

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The Nature Conservancy