Threatened and Endangered Species: Learn about these New Jersey residents

In this lesson, students learn about ecosystems, food sources, and human impact on ecosystems by identifying threatened and endangered species in their area; and proposing a plan to help protect it. Students will be able to create their own threatened and endangered species and explain the impacts their creature faces and how they survive. In addition, students will also identify a threatened or endangered species, research why it is in jeopardy, and propose plans to help protect it. Students can utilize the creature profile cards as a jumping off point for their research.

Time allotment:

- Three, 45-60-minute learning periods (can be made into four learning periods – see Culminating activity, last page)

Learning objectives:

- Understand that living things need air, water, food, light, and shelter. Living things can only survive in ecosystems in which their needs are met.
- Show how a habitat is an organism's home. A habitat provides food, water, shelter, and space.
- Explain that different areas support different kinds of living things, both on land and in water.
- Explain that an ecosystem is a community of living things (plants, animals, and other organisms) interacting with each other and with the nonliving things in the environment (weather, water, soil, sun, air).
- Show that there are many different kinds of living things in any area, and they exist in different places on land and in water.
- Recognize the interdependent relationships between organisms in an ecosystem.
- Understand that human activity can both harm and help ecosystems.

Prep for teachers/parents:

- Read through the entire lesson and print (if able) one copy of the Creature Profile Cards, and the blank Creature Card Profile.
- You will assign one blank card to a group of three students, if in a classroom setting, during the lesson for them to utilize to design their creature.
- Assemble the craft supplies in a bag or bucket that can later be transported to a nearby outdoor setting.
- Later in the lesson, your students will identify and learn about endangered or threatened species in your area. Browse the attached profile cards, or go to https://www.nj.gov/dep/fgw/tandespp.htm to select additional creatures to discuss.
- This lesson can be done via a car ride, or access to an outdoor setting where students are likely to see a variety of places where plants and animals live. In advance of the lesson, be

sure to scout out places where the outdoor activities will work well, such as a neighborhood park, schoolyard, or even a walk through the neighborhood. Notice what kinds of living things (plants and animals) you find and where you find them. Be sure you also troubleshoot any safety concerns, such as traffic, poison ivy, or sharp objects.
- For Part II of this lesson, it would be helpful for each student to have access to a computer.

Materials:

- Creature Card Profiles
- Blank Creature Card Profile
- Notebook or clipboard with paper
- Pencils
- Construction paper
- Craft sticks
- Crayons or markers
- Craft supplies such as pipe cleaners, pom-poms, tape, and glue – anything you have around that would allow your student to design their creature
- Flipchart, poster board, or paper
- String

Learning activities:

Part II

Today your students will consider how changes in habitats may affect the organisms that live there. By playing an interactive food web game, they will experience how the different species of plants and animals in an ecosystem depend on one another.

1. Ask your students to recall the creatures whose habitats they identified yesterday and have a short discussion about the balance between those creatures and the resources they need. What do their creatures eat? If their creatures eat other animals, such as ants, what do they think those animals eat? What might happen if the creature's food source disappeared? Use this discussion to introduce the term "ecosystem." Ecosystem is short for "ecological system." The term describes the interactions between the living and nonliving things in a given place. The plants, animals, and other living things in an ecosystem interact and depend on one another in many ways. Your students will experiment with the interdependence of plants and animals in an ecosystem as they play the game described below.

NOTE: *Games below have two options. Students can either utilize the profiles from the day before to design their own ecosystem, or they can play online at the PBS website: Ecosystem – Feed the Dingo. This online game allows students to choose plants and animals that will allow their ecosystem to thrive.*

2a. Card Game: Have students design their ecosystem by using the T&E profiles that were introduced to the students yesterday. Make sure they decide on the location of their ecosystem (i.e. stream beds, wetlands, forests, desserts, mountainous areas). What plants would be found in those areas, based off their own knowledge of the world they have explored in their everyday lives?

If necessary, students can play the game individually. For students in pairs or that form larger groups, be sure students alternate turns choosing animals to add to their ecosystem and giving reasons why that animal would be beneficial to the system. You also might project the profiles on the whiteboard and play it as a class. As students play, encourage them to think about balance in an ecosystem.

When students have finished playing the game, have a discussion about the challenges in keeping an entire ecosystem in balance. Ask questions such as:

- Was it easy or hard to ensure your ecosystem was benefiting from the creatures you had chosen?
- What surprised you about the number animals you thought were needed in order to keep your ecosystem alive?
- How might this ecosystem change if all the prey animals disappeared? All the plants? All the predators?
- What kinds of plants and animals make up the ecosystem where you live? When you look outside, do you see more plants or more animals? Why do you think this might be?

2b. Digital Game: Have students design their ecosystem by using the T&E profiles that were introduced to the students yesterday. Make sure they decide on the location of their ecosystem (i.e. stream beds, wetlands, forests, desserts, mountainous areas). What plants would be found in those areas, based off their own knowledge of the world they have explored in their everyday lives?

If necessary, students can play the game individually. For students in pairs or that form larger groups, be sure students alternate turns choosing animals to add to their ecosystem and giving reasons why that animal would be beneficial to the system. You also might project the profiles on the whiteboard and play it as a class. As students play, encourage them to think about balance in an ecosystem.

When students have finished playing the game, have a discussion about the challenges in keeping an entire ecosystem in balance. Ask questions such as:

- Was it easy or hard to ensure your ecosystem was benefiting from the creatures you had chosen?

- What surprised you about the number animals you thought were needed in order to keep your ecosystem alive?
- What disappeared first? What plant or animal was it?
- How might this ecosystem change if all the prey animals disappeared? All the plants? All the predators?
- What kinds of plants and animals make up the ecosystem where you live? When you look outside, do you see more plants or more animals? Why do you think this might be?

3a. Card Game: Next, use the game as a segue into a discussion about endangered species. Ask students what would happen if any of the plants or animals disappeared. Can students explain how or why those species may have disappeared? Explain that often animals or plants disappear due to invasive plants (non-native plants) take over and kill off the plants causing animals and insects to lose either their home or food source. In addition, animals lose their homes to new homes and buildings being added to grow towns or from roadways being added or widened. This is why it is important for nonprofits and local government to preserve land for these ecosystems to thrive. Can your students think of any green spaces around their homes? These could be parks, forests or trailways, bike paths, or walking paths. Mention to them that in the real world, plants and animals that disappear completely are said to have gone extinct. If students request an example of what extinct means, dinosaurs are a great example.

3b. Digital Game: Next, use the game as a segue into a discussion about endangered species. Ask students if any of the plants or animals disappeared as they played the game. Most likely, they will all answer yes! Can students explain how or why those species disappeared? Explain that often animals or plants disappear due to invasive plants (non-native plants) take over and kill off the plants causing animals and insects to lose either their home or food source. In addition, animals lose their homes to new homes and buildings being added to grow towns or from roadways being added or widened. This is why it is important for nonprofits and local government to preserve land for these ecosystems to thrive. Can your students think of any green spaces around their homes? Explain that, in the game, students could just add those species back to the game, but in the real world, plants and animals that disappear completely are said to have gone extinct. If students request an example of what extinct means, dinosaurs are a great example.

4. Ask students if they remember the term “endangered species.” If not, explain that endangered species are plants or animals that, for a variety of reasons, are in danger of going extinct—of disappearing forever. When a species is endangered, that means that very few individuals exist, often because they aren’t able to find the resources they need to survive. Repeat for “threatened species”.

5. Then, ask students if they think there might be any endangered species living in their neighborhood. Students tend to link the terms endangered and threatened to animals they have seen on tv or in the zoon – ie. pandas or tigers. It is unlikely that they would recognize any endangered plants or that their hometown likely has some of these endangered or threatened

species right around the corner. Wrap up with a visit to the U.S. Fish and Wildlife service Endangered Species NJ listing. Project the page on the whiteboard, or on your screen if utilizing virtual schooling situations. Ask students if they recognize any of the animals on the list. Tell students that next time you meet, you will be learning about one of these endangered species and discussing how you can help keep this species from going extinct.