Broken Ecosystems

Grade 4 – Science and Technology

Turtle Guardians

Broken Ecosystems

Lesson Details

Grade Level:	4	**Curriculum Links:**	Science and Technology	**Time Needed:**	1 hour
Learning Goal	To learn about the importance of having a balanced ecosystem. As well as, to learn about the impact that the loss of a species can have on an ecosystem through a case study of the St. Mathew Island Reindeer.				
Success Criteria	By the end of this lesson, students will understand the value that predator and prey species have in supporting the health of each other's populations. Students will also learn to extrapolate information from a historical example to make informed decisions about future outcomes using critical thinking skills.				
Specific Expectations	*Understanding Life Systems: Habitats and Communities* • Analyze the positive and negative impacts of human interactions with natural habitats and communities, and evaluate ways of minimizing the negative impacts; • Identify reasons for the depletion or extinction of a plant or animal species, evaluate the impacts on the rest of the natural community, and propose possible actions for preventing such depletions or extinctions from happening; • Use scientific inquiry/research skills (page 15) to investigate ways in which plants and animals in a community depend on features of their habitat to meet important needs; • Demonstrate an understanding of habitats as areas that provide plants and animals with the necessities of life; • Demonstrate an understanding of a community as a group of interacting species sharing a common habitat; • Demonstrate an understanding of why all habitats have limits to the number of plants and animals they can support.				
Materials Needed	Worksheet (attached), Pencil, Graph Paper (optional).				

Lesson Description

Overview	Students will learn about the story of the St. Matthew Island Reindeer in order to understand the importance of having a balanced ecosystem. Students will relate this information to the importance of turtles in their local ecosystems.
Activity	1. Begin by asking the students "what would happen to the planet if humans didn't exist?". Allow for a brief discussion before asking "what would happen if spiders, or mice, or acorns, etc. no longer existed?". 2. Distribute the attached worksheet and have students write down their predictions about what might happen if you add or take away from species populations in an ecosystem. 3. Next, introduce the story of the St. Matthew Island Reindeer. Either re-tell the story or show the video (link found in *Blacklist Masters*). 4. Students will then continue to answer the provided questions on the worksheet. 5. Optional: Have the students create bar or line graphs to display the rise and fall of the St. Matthew Island Reindeer to visualize the impacts. 6. Finally, discuss the importance of turtles in our local ecosystems and what might

Lesson Description

	happen if they were to disappear.
Background Information	Turtles are considered keystone species. A keystone species is an animal whose role in the food-web is essential to an entire chain of linked species, habitats, and ecosystem services. This means that without them the ecosystem can collapse, and elements can be sorely compromised. When it comes to turtles, they are essential in maintaining water quality by removing the sources of harmful bacteria; turtles eat carcasses of fish and animals that die in lakes and wetlands. Turtles are also essential in keeping fish habitat and wetland areas thriving.
Blacklist Masters	• Worksheet (attached) • Video Link(s): St. Matthew Island Reindeer, Threats to Ontario Turtles, Wetlands and Turtles in Ontario, Turtle Food Chains and Food Webs • For more information, please visit https://www.turtleguardians.com/why-saving-turtles-is-important/
Place-Based Learning	Students will reflect on their own community and how local ecosystems are influenced by the plants and animals that live within it. Having this knowledge will allow the students to become more conscious about environmental conservation and how organisms are connected.
Inquiry-Based Learning	Using **Confirmation Inquiry**, students will use their understanding of ecosystem collapse from the case study to apply their knowledge to the importance of turtles. Ask the students: • What would happen to the planet if humans didn't exist? • What would happen if spiders, or mice, or acorns, etc. no longer existed? • What roles do predator species play in changing the ecosystem? What role do prey species play in changing the ecosystem? Is there a common theme? • What do you already know to be a turtle's function in an ecosystem? If those functions aren't performed, what happens?
Turtle Stories	Have you visited a wetland or natural area recently? What plants and animals did you see? How do you think they are connected? Create a food web of the plants and animals you saw, then work out what would happen if one piece of the web disappeared. Students are encouraged to share their experiences, pictures, and worksheets on the Turtle Stories website, found here: https://www.turtlestories.ca/
Turtle Guardian Program Links	After completing **Level 1** (Ontario Turtle Identification) of the **Turtle Guardian Program**, students can move onto **Level 2** (Wetland Watchers). In this level the students learn the importance of wetland protection and how to protect turtle nests. They then can become official nest sitters and wetland watchers (when accompanied by an adult). For more information, please visit https://www.turtleguardians.com/what-is-a-turtle-guardian/

My Notes

Broken Ecosystems

Q1. What would happen if humans didn't exist?

There are benefits and downfalls to the consequence of humans not existing. If humans did not exist then natural land would take over creating better and more homes for wildlife. However, at risk species might be lost to competition if humans were not around to help protect them.

Q2. What would happen if you add or take away species in an ecosystem? For example, what would happen if you removed acorns?

If a species is added or taken away then the ecosystem is placed out of balance. If acorns were removed then many animal species would suffer from the loss of food, and trees would not grow affecting other animal and plant species as well.

Q3. How did you feel after learning about the death of all the St. Matthew Island Reindeer?

_____

_____

Q4. What happened when the lichen ran out on St. Matthew Island? Why did the lichen run out?

With no lichen left, the reindeer began to eat grass which affected their health and increased competition amongst the species. The lichen ran out because after the humans left the island the reindeer began to reproduce and their population increased.

Q5. What roles do predator species play in changing the ecosystem? What role do prey species play in changing the ecosystem? Is there a common theme?

Predator and prey species help to keep the system in balance.

Q6. What do you already know to be a turtle's function in an ecosystem?

A turtle is considered a keystone species in their habitat.

Q7. What would happen if turtles were absent from their ecosystem? What would happen to their prey species? Their predator species?

If turtles were absent from their ecosystem then the system would collapse. Their prey species would begin to increase in numbers which also puts the system out of balance. Their predator species would look towards other species for food or they would die without their food supply.

Turtle Guardians

Broken Ecosystems

Q1. What would happen if humans didn't exist?

_____

_____

Q2. What would happen if you add or take away species in an ecosystem? For example, what would happen if you removed acorns?

_____

_____

Q3. How did you feel after learning about the death of all the St. Matthew Island Reindeer?

_____

_____

Q4. What happened when the lichen ran out on St. Matthew Island? Why did the lichen run out?

_____

_____

Q5. What roles do predator species play in changing the ecosystem? What role do prey species play in changing the ecosystem? Is there a common theme?

_____

_____

_____

Q6. What do you already know to be a turtle's function in an ecosystem?

_____

_____

_____

Q7. What would happen if turtles were absent from their ecosystem? What would happen to their prey species? Their predator species?

_____

_____

_____