



St. Kateri Outdoor Learning Centre
Lesson Plan
Understanding Interactions Within Ecosystems



Target Station:	The entire trail - 2.5 km
Total Length of Time Required:	Time dedicated to hiking / walking = 1 hour Time dedicated to complete the activity = see above
Target Grade(s):	Grade 7, 9
Target Subject(s):	Science
Overall Curriculum Expectation(s):	<ul style="list-style-type: none"> • Grade 7 Science – A3 – demonstrate an understanding of interactions between and among biotic and abiotic elements in the environment • SNC1D – B2 - investigate factors related to human activity that affect terrestrial and aquatic ecosystems, and explain how they affect the sustainability of these ecosystems • SNC 1D – B3 – demonstrate an understanding of the dynamic nature of ecosystems, particularly in terms of ecological balance and the impact of human activity on the sustainability of terrestrial and aquatic ecosystems • SNC1P – B2 - investigate some factors related to human activity that affect terrestrial or aquatic ecosystems, and describe the consequences that these factors have for the sustainability of these ecosystems • SNC 1P - B3 – demonstrate an understanding of characteristics of terrestrial and aquatic ecosystems, the interdependence within and between ecosystems, and the impact humans have on the sustainability of these ecosystems
Specific Curriculum Expectation(s):	<ul style="list-style-type: none"> • Grade 7 Science – A3.1 – demonstrate an understanding of an ecosystem as a system of interactions between living organisms and their environment • Grade 7 Science – A3.2 – identify biotic and abiotic elements in an ecosystem, and describe the interactions between them • SNC 1D – B2.1 – use appropriate terminology related to sustainable ecosystems • SNC 1D - B3.1 – compare and contrast biotic and abiotic characteristics of sustainable and unsustainable terrestrial and aquatic ecosystems • SNC 1P - B2.2 – investigate the characteristics and interactions of biotic and abiotic components of a terrestrial or aquatic ecosystem, and describe the importance of these components in a sustainable ecosystem • SNC 1P - B3.5 – identify some factors related to human activity that have an impact on ecosystems
Catholic Graduate Expectation(s):	<ul style="list-style-type: none"> • CGE1e -speaks the language of life... “recognizing that life is an unearned gift and that a person entrusted with life does not own it but that one is called to protect and cherish it.” (Witnesses to Faith) • CGE4h - participates in leisure and fitness activities for a balanced and healthy lifestyle • CGE7i - respects the environment and uses resources wisely
Connection to FNMI Perspectives and/or Teachings:	First Nation, Métis, and Inuit (FNMI) peoples’ relationships to their land represent respectful and sustainable models for human interaction with nature. Teaching these models can help change the negative attitudes that hurt the environment. FNMI ecological perspectives are relevant in mainstream education and can be incorporated into elementary classrooms. See <i>Teaching for Ecological Sustainability: Incorporating Indigenous Philosophies and</i>

	<p>Practices at http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/WW_Teaching_Ecological.pdf</p>
Learning Goals:	We are learning that each species occupies an ecological niche defined by abiotic and biotic components.
Prerequisite Knowledge and/or Skills:	<p>Before engaging in this activity, students should:</p> <ul style="list-style-type: none"> • Have a working knowledge of biotic and abiotic factors in an ecosystem. • Have been taught about, and be able to identify, different interactions within an ecosystem (i.e., mutualism, predation, competition, commensalism). • Be dressed appropriately to hike the trail. • Be asked to bring a digital camera, phone with a camera, or tablet with them for documentation. (Note: only one camera is needed for every pair or small group.)
Required Materials:	The tote will include copies of the worksheet, as well as one answer sheet for the teacher. Clipboards and pencils will also be included for student use. At least one camera or phone per small group (not included in the tote) would be beneficial for documentation.
Activity and Approximate Times:	<p>Explain to students that no two species can occupy the same niche. One species will be forced to adapt its requirements and move to an adjacent niche; in essence, one species will have to settle for less. For example, <i>nuthatches live in the same habitat as woodpeckers, and the nuthatches will nest in abandoned woodpecker cavities. Both species eat small insects and larvae; however, the nuthatch does not bore large holes into the tree as the woodpecker does. Instead, the nuthatch moves down the tree, facing the opposite direction, and pries out what other birds have missed.</i> Competitive exclusion is the process of one species pushing a competing species out of the environment to which both are adapted.</p> <ol style="list-style-type: none"> 1. Divide students into pairs or groups of three. Ensure that each group has at least one camera (e.g., tablet, phone, digital camera) with them. 2. The hike will take students approximately 45 minutes to complete. They will be stopping to read the information at each checkpoint and be looking for evidence of the various types of interactions – mutualism, predation, competition, commensalism – throughout the hike. 3. When students observe an example of any type of interaction, they will take a picture and save it to be used for the follow up activity. 4. Students will record their observations on the worksheet provided.
Suggested Modifications or Extensions:	
Assessment:	Students will create a slideshow using the pictures they took and a description of the interaction observed. Possible presentation formats include Prezi, Google Slides, or PowerPoint.
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Date:	June 7, 2016
Modified by:	
Date:	

Interactions Within Ecosystems – Student Worksheet

Group Members' Names: _____

In this activity, you will be hiking the 2.5 km self-guided trail at St. Kateri Outdoor Learning Centre, looking for evidence of the various types of interactions among different organisms within an ecosystem. Use the check points to help if needed.

Recall: Symbiosis is the close and long-term interaction between two or more different biological species.

Part 1 - Types of Biological Interactions

Interaction	Definition	Examples
Mutualism	Both organisms will benefit from the interaction.	
Predation	One organism is consumed by another (i.e., predator – prey relationships).	
Competition	Two organisms compete for the same resource, in the same location.	
Commensalism	One organism benefits from the interaction, while the other is not harmed.	

Part 2 - Human Interactions

Find examples of human interactions within the ecosystem.

Examples:

Part 3 – Abiotic Interactions

Interaction	Activities and Questions	Examples and Answers
Water	<p>Water is essential for life within an ecosystem.</p> <p>How is water interacting within the ecosystem?</p>	
Soil	<p>Look for different types of soils.</p> <p>How does the type of soil change the type of vegetation that is growing?</p>	
Sunlight	<p>Note the amount of sunlight that might be available within the ecosystem.</p> <p>What effect does too much sunlight or not enough sunlight have on the vegetation growing within the ecosystem?</p>	

Part 4 – Follow-Up Questions

1. What interactions were easy to spot? Which were more difficult?

2. What assumptions needed to be made about some interactions?

Interactions Within Ecosystems – Teacher Answer Sheet

Group Members' Names: _____

In this activity, you will be hiking the 2.5 km self-guided trail at St. Kateri Outdoor Learning Centre, looking for evidence of the various types of interactions among different organisms within an ecosystem. Use the check points to help if needed.

Recall: Symbiosis is the close and long-term interaction between two or more different biological species.

Part 1 - Types of Biological Interactions

Interaction	Definition	Examples
Mutualism	Both organisms will benefit from the interaction.	Station 6 – Lichen and mosses Worms and leaves (decomposition)
Predation	One organism is consumed by another (i.e., predator – prey relationships).	Bears – berries, fish Hawk – fish Wolves – moose Tracks – fox den Woodpeckers - insects
Competition	Two organisms compete for the same resource, in the same location.	Trees competing for sun, water Wild flowers competing with trees
Commensalism	One organism benefits from the interaction, while the other is not harmed.	Birds and trees (nests) Station 14 – Old feeds New

Part 2 - Human Interactions

Find examples of human interactions within the ecosystem.

Examples: Tree cutting, garbage, trails, buildings

Part 3 – Abiotic Interactions

Interaction	Activities and Questions	Examples and Answers
Water	Water is essential for life within an ecosystem. How is water interacting within the ecosystem?	Microorganisms, fish habitat Animals cleaning, drinking Erosion
Soil	Look for different types of soils. How does the type of soil change the type of vegetation that is growing?	Dry soil – deciduous trees Wet soil - coniferous
Sunlight	Note the amount of sunlight that might be available within the ecosystem. What effect does too much sunlight or not enough sunlight have on the vegetation growing within the ecosystem?	Full canopies, taller trees mixed with shorter trees Weathering

Part 4 – Follow-Up Questions

1. What interactions were easy to spot? Which were more difficult?

2. What assumptions needed to be made about some interactions?

