



St. Kateri Outdoor Learning Centre
Lesson Plan
Classification of Organisms and Microorganisms



Target Station(s):	Entire Trail
Target Grade(s):	Grade 11 Biology, University Preparation
Target Subject(s):	Biology
Overall Curriculum Expectation(s):	<ul style="list-style-type: none"> • SBI3U – A1 – demonstrate scientific investigation skills in the four areas of skills • SBI3U – B2 – investigate, through laboratory and/or field activities or through simulations, the principles of scientific classification, using appropriate sampling and classification techniques
Specific Curriculum Expectation(s):	<ul style="list-style-type: none"> • SBI3U - A1.2 – select appropriate instruments and materials and identify appropriate methods, techniques, and procedures, for each inquiry • SBI3U - A1.6 – compile accurate data from lab and other sources, and organize and record the data, using appropriate formats, including tables, flow charts, graphs and/or diagrams • SBI3U – B2.3 – use proper sampling techniques to collect various organisms from a marsh, pond, field, or other ecosystem, and classify the organisms according to the principles of taxonomy • SBI3U - B2.4 – create and apply a dichotomous key to identify and classify organisms from each of the kingdoms
Catholic Graduate Expectation(s):	<ul style="list-style-type: none"> • 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:	<p>FNMI people have long used plants for a variety of purposes. Students could research plants indigenous to Ontario and identify their uses. See Chapter 4 of <i>Traditional Plant Foods of Canadian Indigenous People</i> at http://www.fao.org/wairdocs/other/ai215e/AI215E06.htm</p>
Learning Goals:	<p>We are learning to:</p> <ul style="list-style-type: none"> • Obtain water samples to observe microscopic organisms. • Prepare microscope slides. • View microscopic organisms using the microscope. • Classify organisms and trees using dichotomous keys.
Prerequisite Knowledge and/or Skills:	<p>Before engaging in this activity, students should be familiar with:</p> <ul style="list-style-type: none"> • Binomial nomenclature, taxonomy classification, and dichotomous keys. • Appropriate terminology, including leaf venation, leaf margin type, and leaf arrangement. • How to use and care for a microscope properly.
Required Materials:	<p>The tote will include the following materials:</p> <ul style="list-style-type: none"> • Nets • Collecting bottles

	<ul style="list-style-type: none"> • Microwave covers • Classification keys for water organisms • Copies of <i>Trees of Ontario</i> • Trail map with stations • Pencils • Clipboards • Copies of <i>How to Obtain a Pond Water Sample</i> • Copies of data tables • Copies of <i>Rules for Scientific Drawings</i> • Copies of <i>Guide to Identification of Fresh Water Microorganisms</i> <p>Classes should bring with them the following items:</p> <ul style="list-style-type: none"> • Computing devices (e.g., tablets, phones, laptops) • Microscopes and microscope slides
<p>Activity and Approximate Times:</p>	<p><u>PRE-ACTIVITY</u> – 30 minutes</p> <p>The following activity should be done upon arrival to St. Kateri, since the pond sample must sit for about two hours before the samples are viewed.</p> <ol style="list-style-type: none"> 1. Read the attachment <i>How to Obtain a Pond Water Sample</i>. 2. Have students go in groups of three to the shore of the lake. 3. Instruct them to follow the instructions in the attachment and obtain a small bottle of water to be used in ACTIVITY 2. <p><u>ACTIVITY 1</u> – 90 minutes</p> <p>While students are waiting for their water samples to be viewed, they should complete this activity.</p> <ol style="list-style-type: none"> 1. Provide students with an orientation to ACTIVITY 1 that will be taking place. Show a map of the trail. 2. Instruct students to walk the trail and take eight samples of leaves from trees or shrubs at any of the stations. This will take at least 45 minutes. 3. Using their data table, students will record data regarding each of their samples, including bark; coniferous vs deciduous; leaf arrangement (e.g., opposite, whorled, alternate); and leaf type (e.g., simple, compound). 4. Using the data collected, students will identify the tree or shrub using scientific names. They will sketch the leaf, with leaf arrangement, type and venation. This will take at least 30 minutes. <p><u>ACTIVITY 2</u> – 60 minutes</p> <p>Once students have successfully completed the previous activity, they can return to the lake and do the following.</p> <ol style="list-style-type: none"> 1. Obtain the water sample taken earlier. 2. Make a microscope slide using the techniques discussed in class. 3. View the observed specimens under the microscope at low, medium and high

	<p>magnification.</p> <ol style="list-style-type: none"> 4. Review the <i>Rules for Scientific Drawings</i>. 5. Sketch ONE microorganism following all the rules. 6. Use the internet or a classification key to identify the type of organism viewed. The <i>Guide to Identification of Fresh Water Microorganisms</i> or http://www.msucleus.org/watersheds/mission/plankton.pdf might assist.
Suggested Modifications or Extensions:	If students finish early, they can use the worksheet on classification of organisms to further develop understanding .
Assessment:	<p>Refer to the following documents:</p> <ul style="list-style-type: none"> • Scientific Drawing Checklist • Data Collection Chart for Leaves • Leaf Identification Rubric
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