Investigating Local Water

Institut Polaris Institute

**Gr.9 Science: Biology—
Sustainable Ecosystems
(SNC1D/ SNC1P)***

December 2014

Full resource accessible online at: www.polarisinstitute.org/education

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Curriculum Expectations:

Strand A (A1):   Scientific Investigation Skills

Strand B: Biology – Sustainable Ecosystems
    B1. Relating Science to Technology, Society, and the Environment
    B2. Developing Skills of Investigation and Communication
    B3. Understanding Basic Concepts

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*Teachers may also find connections to the *Gr.11 Environmental Science (SVN3M/ SVN3E)* curriculum

Section I: Creating a Local Context for Water

Pre-Activity – Field Trip or Guest Speaker

[OPTION A] An outing for students to get out of the classroom to see first-hand where water comes from in the community. This pre-activity is relevant because it provides a context for the main exploration in this section [see: Community Water Map]. It also provides an opportunity for students to ask questions and/or make observations of land use in the community which are relevant to explorations of water quality in Section II.

[OPTION B] Students invite an "expert" on water in their community to the classroom and prepare questions for discussion. This pre-activity is relevant because it provides an option for the teacher to help students gather the information they need to create the Community Water Map, without taking students off-site (as in Option A).

Activity – Community Water Map

Mapping activity and research project to create a picture and understanding of water in the community. This activity is relevant because it provides a context for the scientific water quality investigation in Section II. The main goals of the activity are to develop an appreciation for: where local water comes from, what affects it, how it is distributed & treated, how it is used in the community, and where it goes.

(cont'd on reverse…)

Section II: Scientific Investigation of Local Water Quality

Pre-Activity – Water We Looking For?

Part I: Introduction to Water Quality
The goal of this activity is to help students to understand the importance of scientific sampling & water quality analysis. Students make visual observations of several water samples and reflect on different strategies for determining water quality.

Part II: "So-What?" Scenarios
The goal of this activity is to help students to identify and understand commonly tested water quality parameters. Students are presented with a scenario of an activity or event that has an impact on local water quality, and must decide what water quality parameters *might* be affected in the scenario.

Activity – What's in the Water?

Part I: Testing for Water Quality
Scientific investigation skills and critical thinking form the basis for this inquiry-based learning activity. Students will plan and carry out water quality sampling in the local community. They will then conduct water quality tests on the samples, using their previous learning to choose which parameters to test for.*

*Note: Before undertaking this activity with students, you must choose and order a water quality testing kit (if you don't already have access to testing materials within your school or board). Refer to the resource section "Choosing a Test Kit" for more information.

Part II: Interpreting the Results
Through research on water quality standards, students will determine which of their results show areas for concern. Using their knowledge of the watershed and of water quality parameters, students will interpret their test results and make preliminary conclusions about the data.

Post-Activity – Protecting & Restoring Water Quality

Part I: Revisiting "So-What?" Scenarios
Students are asked to revisit the scenarios from *Water we Looking For? (Pre-Activity, Part II)*. Through basic research and application of critical thinking skills, students will outline protection/ mitigation/ restoration measures for the water quality impacts present in a scenario of their choice.

Part II: Ask an Expert
Students work in teams to develop questions for an "expert" about local water sources, impacts to water quality, and potential protection and/or restoration measures.